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November 26, 2003

By Overnight Delivery
Eileen Furey, Esq.
Associate Regional Counsel
USEPA Region 5 C-14J
77 W. Jackson Blvd.
Chicago, IL 60604

Dear Eileen:

With the Environmental Settlement Agreement between the United States, the State of Michigan and the various Plainwell parties endorsed and subject to public comment, you have asked whether certain confidential materials submitted in response to EPA's March 25, 2002 Request for Information to Plainwell Inc. ("Plainwell"), Milprint Inc., Chesapeake Corporation, Philip Morris Industrial Inc., Simpson Paper Company, the Simpson Plainwell Paper Company, the Plainwell Paper Co., Inc., Plainwell Holding Company, and Plainwell Paper Company (collectively referred to herein as the "Respondents") may be released. Those materials include Plainwell's responses to the KRSG mediation questionnaire and the underlying documents supporting the responses.

It is our understanding that EPA wishes to release these mediation documents both for examination during the public comment period and in response to a specific FOIA request EPA first received in July 2003. As we indicated when we originally produced these mediation documents to EPA in the context of settlement discussions, we believe they are covered by a number of privileges, including, without limitation, the mediation privilege. Notwithstanding these privileges, Plainwell recognizes EPA's need to release this information in support of the Environmental Settlement Agreement. By agreeing to the release these limited documents, at EPA's request to support the settlement, Plainwell does not waive any privileges applicable to any other materials prepared in the context of the KRSG mediation.

It is also our understanding that the pending FOIA requests do not seek copies of either the redacted or non-redacted Stock Purchase Agreements by and among the Respondents, which were previously provided to EPA. Those documents were provided for settlement purposes only and are entitled to protection from disclosure under EPA's Confidential Business Information regulations, 40 C.F.R. Part 2, and pursuant to Federal Rule of Evidence 408. Plainwell continues to object to any FOIA request that seeks any of the Stock Purchase

HUNTON & WILLIAMS

Eileen Furey, Esq.
November 26, 2003
Page 2

Agreements or amendments thereto, including without limitation those provided to EPA by letters dated January 29 and 31, 2002.

If you have any questions regarding this letter, please do not hesitate to call me.

Very truly yours,

Andrew Skroback (AS)

Andrew E. Skroback

cc: Kathy Robb, Esq.

KALAMAZOO RIVER SUPERFUND SITE MEDIATION
GENERAL SITE INFORMATION QUESTIONNAIRE

RESPONSES REGARDING PLAINWELL MILL

For purposes of this questionnaire, the term "your property" includes all properties or production facilities owned or operated, or previously owned or operated, by you, or by your predecessors in interest, that are located, in whole or in part, within 1 mile of the Kalamazoo River, Portage Creek, or their tributaries, or which have ever discharged wastewater from a production facility to the Kalamazoo River, Portage Creek, or their tributaries, or to any POTW located thereon. The terms "release," "disposal," "facility," "owner," and "operator" shall have the same meaning as under CERCLA, 42 U.S.C.A. §§ 9601 *et. seq.* For the purposes of this questionnaire, carbonless copy paper and NCR paper have the same meaning. For questions 4 through 27, the relevant time period is 1954 through 1985, unless otherwise stated. For the remaining questions, the relevant time period is 1954 to present, unless otherwise stated.

Each question shall be answered in a narrative fashion, and no answer should merely refer the reader to referenced documents. After providing an abbreviated narrative response, however, an answer may then refer the reader (by document and relevant page numbers) to attached excerpts of document(s) that provide a more expansive narrative answer.

To the extent not previously produced to the document depository in Atlanta, Georgia ("depository"), any document referred to or relied on in answering the questions below, and all other documents responsive to the questions below in Respondent's (or their agent's or affiliate's) control or possession that are not subject to a valid claim of privilege under Federal Rule of Evidence 501, shall be produced to the depository. Excepted from this production requirement are BB&L documents and other documents in the administrative record produced by other consultants on behalf of the Kalamazoo River Study Group ("KRSG") or its individual members.

As part of your response to each question (or sub-part thereof) below, identify and reference (by document and relevant page numbers) all documents that were relied on, or otherwise used, to answer the question (or sub-part), or that are otherwise materially responsive thereto. In identifying any responsive document that was not produced to the depository as part of your initial production, Respondent shall designate each such document as a document not previously produced.

As part of your response to each question asked below, please list the person(s) consulted for the answer to the question. For each question that requires calculations to be made to produce the answer, please attach a calculation brief that presents the calculations made, and explains the basis for the calculations, including any data used and assumptions made. Where available, PCB data should provide both total PCBs and Aroclor specific information.

Where a question applies to more than one production facility located, past or present, on your property, please provide a separate answer for each production facility. For purposes of this questionnaire, "production facility" is defined as a collection of processes at one location (e.g. a de-inking process, recycling process, and/or paper production process) that produces a well-defined end-product for sale or use off-site. Please be consistent with the identification of production facilities throughout your responses to the questionnaire.

In answering the questions below, Respondents are free to withhold the name (including redacting the name on any documents provided) of any off-site landfill that is more than one mile from the Kalamazoo River, its tributaries, and the properties of the mediation participants.

LIST OF ACRONYMS AND ABBREVIATIONS[1]

BBL	Blasland, Bouck and Lee
BBLES	Blasland, Bouck and Lee Environmental Services
BOD	Biochemical Oxygen Demand
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act (1980)
CFR	Code of Federal Regulations
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
KRSG	Kalamazoo River Study Group
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
NCASI	National Council of the Paper Industry for Air and Stream Improvement, Inc.
NCR	No Carbon Required
NON	Notice of Non-compliance
NPDES	National Pollutant Discharge Elimination System
NREPA	Natural Resources and Environmental Protection Act
PCB	Polychlorinated Biphenyl
POTW	Publicly Owned Treatment Works
ROD	Record of Decision
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSS	Total Suspended Solids
TVS	Total Volatile Solids
USEPA	United States Environmental Protection Agency
WRC	Water Resources Commission

A	amperes
bgs	below ground surface
fpm	feet per minute
kVA	kilovolt amperes
lbs/day	pounds per day
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
mgd	million gallons per day
ppb	parts per billion
ppt	parts per trillion
t/d	tons per day
µg/l	micrograms per liter
V	volts

[1] Although the acronyms and abbreviations listed may be commonly used in the industry, they are presented solely for the purposes of the Plainwell Mill responses to this questionnaire. We do not assume that other respondents to the questionnaire will use these same acronyms or abbreviations.

LIST OF DEFINITIONS[1]

broke – a type of unprinted wastepaper; broken, manufactured sheets, **sheets that do not meet manufacture specifications,** or sheets that have, for some reason, been returned to the process

clear water – clear filtrate from the save-alls (the process stream from the save-alls that does not contain many paper fibers)

cloudy water – concentrated filtrate from the save-alls (the process stream from the save-alls that contains the concentrated paper fibers)

contact water – a type of process wastewater; water that comes in direct contact with components of the paper product

de-inked pulp – pulp that is derived from de-inked material

de-inking – the process of removing the ink from wastepaper and then using this wastepaper to produce pulp

effluent – water that is discharged from a particular process operation or wastewater treatment process

hydropulper – a machine that is used to rehydrate dry pulp, pulp up recycled paper, and otherwise mixes and blends paper stock with water and other additives to create a pulp slurry

non-contact water – a type of process wastewater; water that does not come in direct contact with components of the paper product (such as cooling water)

paper production – the process of using pulp to produce paper

printed wastepaper – wastepaper that contains printing, such as books, magazines and office materials

process wastewater – output water from the de-inking, recycling and paper production processes

pulp – stock used in the paper production process; a mixture of ground up, moistened cellulose material from which paper is made

raw water – input water for the de-inking, recycling and paper production processes (well water)

recycled pulp – pulp that is derived from recycled material

recycling – the process of using unprinted wastepaper, broke, or trim to produce pulp (for the purposes of this response, this excludes the process of de-inking)

side roll – the portion of a finished roll of paper that has been removed from the manufactured roll in order to meet particular width specifications of the customer

sludge – the collection of solids (fibrous material) that are generated during the wastewater treatment process

trim – a type of unprinted wastepaper; paper shavings that have been trimmed off in the finishing process

unprinted wastepaper – wastepaper that contains no printing, such as tab cards, paper plates, broke and trim

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[1] Although the definitions to the terms listed may be commonly used in the industry, they are presented solely for the purposes of the Plainwell Mill responses to this questionnaire. We do not assume that other respondents to the questionnaire will use these same term definitions.

virgin pulp – pulp that comes directly from trees and has not been previously manufactured into any kind of paper product

wastewater effluent – process wastewater that is treated and then discharged through an outfall

wastewater treatment – the treatment of contact and process wastewater

wastepaper – stock used in the de-inking or recycling processes

wastewater effluent – treated water from the wastewater treatment process that is discharged through an outfall

wastewater influent – water that enters the wastewater treatment process

white water – water that drains from wet pulp as it is sequentially dried in the paper machines and driers; it contains paper fibers

I. General Information

Question No. 1: Mediation Participant Information

a) Company Name;

Plainwell Inc.

b) Address(es) of your property;

The Plainwell Mill (the "Mill") is located at 200 Allegan Street in Plainwell, Michigan 49080. The 12th Street Landfill is located on 12th Street in Otsego Township, Michigan.

c) EPA ID#s; RCRA #s; NPDES #s;

Generator USEPA ID No. MID053666228 (S12288).

The following National Pollution Discharge Elimination System (NPDES) permit number applies to outfalls 002, 003, 004, 005, 006, and 007: NPDES Permit No. MI0003794 (S14523; S14967; S14983; S14994; S12247).

d) Type of business entity;

Plainwell Inc. is a Delaware corporation.

e) Name, title and affiliation of the person(s) completing questionnaire.

Justin Gragg, Staff Scientist, ARCADIS JSA
David Haury, Project Advisor I, ARCADIS JSA
Kathryn R. Huibregtse, Vice President, RMT, Inc.
Joseph P. Jackowski, Attorney, Weyerhaeuser
Daniel Kort, Staff Scientist/Engineer II, ARCADIS Geraghty & Miller
Timothy J. Lozen, Attorney, Jaffe Raitt Heuer & Weiss
Michael Maierle, Senior Project Staff II, ARCADIS Geraghty & Miller
Steven L. Martin, Senior Project Manager, RMT, Inc.
James E. McCourt, Senior Environmental Manager, Weyerhaeuser
Wesley May, Project Staff I, ARCADIS Geraghty & Miller
Katherine Prickett, Project Staff II, ARCADIS JSA
Kathy Robb, Attorney, Hunton & Williams
Andrea Sarkadi, Project Assistant, ARCADIS JSA
Andrew Skroback, Attorney, Hunton & Williams

Question No. 2: Past and Present Operators, Owners and Activities

a) Identify all prior and subsequent owners and operators of your property, and their dates of ownership and/or operation.

1886 – 12/31/56	Michigan Paper Company of Plainwell (S00017; S00034-35; S00040; BBL, p. 3-27, 1992[1]).
12/31/56 - 1/64	Hamilton Paper Company (S00035)
1/64 - 11/27/70	Weyerhaeuser (S00017; S00035; S00957; BBL, p. 3-27, 1992; S00955-S00979).
11/27/70 - 12/3/87	Plainwell Paper Co., Inc. (S06854-S06855; S00292, S00932-945; S00948-954; S06869; S00017; S00163; BBL, p. 3-27, 1992).
12/3/87 - 6/12/97	Simpson Plainwell Paper Co. (S00165; S00530; BBL, p. 3-27, 1992).
6/12/97 - 3/98	Plainwell Paper Company (S00165; S00530; BBL, p. 3-27, 1992).
3/98 - Present	Plainwell Inc.

b) Briefly identify and describe your property.

The Mill is located at 200 Allegan Street in Plainwell, Michigan. The property is a 34-acre property bordered by the Kalamazoo River to the northeast, the Plainwell central business district to the east, residential property to the south, and the Plainwell wastewater treatment plant to the northwest. Improvements on the Mill property include several connected buildings containing operations and administrative offices, parking lots, an activated sludge treatment system, and primary and secondary clarifiers.

The 12th Street Landfill occupies approximately 6.5 acres in Otsego Township, Michigan. The landfill is located on 12th Street approximately 0.5 miles northeast of the intersection of State Highway M-89 and 12th Street, and 1.5 miles northwest of the City of Plainwell. The 12th Street Landfill is bordered to the east by the Kalamazoo River (near the former Plainwell Dam), to the north and west by wetlands, to the south and southeast by industrially developed lands and moderately vegetated woodlands, and to the south and southwest by a gravel pit operation. The landfill was used from 1955 to 1981 for the disposal of paper making residuals from the Mill. The landfill was covered with soil and seeded in 1984. The top is currently vegetated by grass and shrubbery.

[1] Full references for cited reports, depositions, etc., that are in the public record are provided in Attachment 1.

c) List past operations at your property, providing the name of the business, nature of the business, SIC codes (if available), and dates of operation.

The Michigan Paper Company of Plainwell founded a paper mill on the Mill property in 1886 (S00017; S00034). Despite several changes in ownership (see response to Question No. 2 (a)), and changes in the size and type of the paper making operations (see response to Question No. 3), the Mill has manufactured various types of paper since 1886 (e.g., S00034-S00035).

d) Briefly describe current operations at your property.

The Mill remained a functioning paper mill until November 2000, when it ceased operations (061354[1]). See response to Question No. 3 for specific information on the paper making operations.

Question No. 3: Production Facility Information

Identify and describe each production facility, past or present, including:

The Mill is comprised of one main building, added to over the years, containing most of the components for paper production, except the wastewater treatment system, which is located north of the main building. The wastewater treatment system is located approximately 0.2 mile from the main building. The components of the Mill included de-inking (until January 1963), recycling, paper production, and wastewater treatment and disposal.

a) The dates of use or operation.

- The Mill began operating at the turn of the century. Sources indicate the year of the Mill's initial construction to be 1886 (BBL, p. 3-27, 1992; S00017) or 1887 (S19916).
- Paper machines have been in regularly scheduled operation (including periods of downtime related to maintenance) from 1903 to November 6, 2000 (S21375; 061354), with the exception of August through December, 1970, when Mill employees were on strike (S20125; S20139).
- De-inking facilities were operated from 1910 to January of 1963 (BBL, p. 3-6, 1992; BBL, p. 3-27, 1992; S00043; S00289; S00290; S00348; S00980; S19692-S19694). Other, limited information indicates that de-inking may have been discontinued sometime late in 1962 (S07279-S07280). However, given the preponderance of evidence, including a December, 1965, memo stating that de-inking ceased in January of 1963 (S19667), and the fact that small amounts of paper stock were still being used as late as December of 1962 (S00983), it is believed that de-inking completely ceased in January of 1963.
- Paper coating facilities were operated from 1940-1948 (S00034) and began again in 1965 (S20143-S20146).

[1] Bates Nos. 050000 through 063779 are being submitted to the depository with the submission of these responses and were not part of the original production.

Various Wastewater Treatment Pilot Plants were operated between 1942 and 1954:

- Between September 1 and September 26, 1942, a pilot plant was operated at the Mill to study the effectiveness of coagulation and settling in the removal of suspended solids in wastewater **that was representative of the combined wastewater from the Mill** (S24507-S24518).
- Initiated by the Kalamazoo River Improvement Co. and National Council of the Paper Industry for Air and Stream Improvement, Inc. (NCASI), a pilot waste treatment plant was constructed at the Mill in 1947 and was operated through 1948, **treating de-ink wastewater** (0064474-0064480; 0064485-0064523; 0064552-0064614; S24495-S24500).
- A full scale treatment plant, consisting of primary and secondary waste treatment, was constructed in 1949**, specifically for the treatment of de-inking wastewater (0064485-0064523;** S24495-S24500). Operations of the demonstration plant began in September 1950 and continued through December of 1951**, when testing conducted by the Kalamazoo River Improvement Co. was concluded** (0064343).
- The Mill purchased the treatment plant from the Kalamazoo River Improvement Co. in 1952 and operated it **again** at least through the summer of that year (S24500).

- A full-scale primary wastewater treatment system was installed in 1954 and a secondary treatment system began operating in 1967 (S19836; S00003). As part of the primary treatment system, sludge was temporarily held in dewatering lagoons before being transported to the 12th Street Landfill. The 12th Street Landfill was used for disposal of dewatered sludge from 1955 to 1981 (S00003). A sludge dewatering facility was placed into operation in August 1981, after which the dewatering lagoons and the 12th Street Landfill were no longer used (BBL, p. 3-30, 1992; Lawton, p. 37, 1997; S00003; S22384-S22385; S07280). Sludge generated by the dewatering facility was disposed of at commercial landfills (S07280; S00332; S00735; S12273).
- The Mill was closed on November 6, 2000 (061354).

b) Its location, providing a location map if possible.

The Mill is located in Plainwell, Michigan, near the intersection of Allegan and Main Street. The Mill is situated on the west bank of the Kalamazoo River. Aeration and sludge lagoons are located approximately 0.2 miles northwest of the main production facility along the bank of the river. Location and facility maps can be found in Figure 1.

c) A description of the nature of its operations and processes, past and present.

The only commercial operation at the Mill was paper production, which included de-inking, recycling, and wastewater treatment processes. For most of its existence, the Mill produced paper on three Fourdrinier paper machines, which typically operated 5 to 7 days a week, 24 hours a day (KS01400001; S14983; S21002; S21251; S21375).

The stock sources for paper production included virgin pulp and pulp derived from de-inking (which completely ceased at the Mill in January of 1963) and/or recycling. All of the virgin pulp, which consisted primarily of bleached kraft and sulfite, was purchased from outside sources

(S14791; S14983; S20052; S20055; S21376). De-inked pulp and recycled pulp were **predominantly** generated internally at the **Mill, though small amounts were also** purchased from outside sources **(Table 4; Burd, p. 26, 1997; Honeysett, pp. 18-19, 1997).**

At the Mill, wastepaper (books, magazines, office materials, and unprinted paper materials) was used to generate de-inked and recycled pulp. **During the period of de-inking, 40-60 percent of the furnish was de-inked stock (Table 3). At least 90 percent of the de-ink stock consisted of #1 heavy book and magazine wastepaper (nearly all of which was magazine). Up to 10 percent of the remaining wastepaper furnish was made up of ledger paper that was used to "sweeten" the stock (John Kauffman Affidavit).**

Available records indicate that the types of wastepaper stock used during the period of de-inking were as follows:

- **1950-1951: "Old papers, essentially magazines" were used to make internally generated de-inked pulp (0064488).**
- **1953-1956: Books, magazines, and office materials were used in the de-inking process (Gren, pp. 11-12) and internal broke and trim (i.e., "shavings off the rewinder") were recycled (Gren, p.20).**
- **1957: Magazines and sheet paper (i.e., "multi-form forms, bond paper, multiple collated, continuous feed" paper) were used in the de-inking process. Papers were classified as colored manifold, white manifold bond, or magazines (Burd, pp. 7-9).**
- **1958: Only magazines were used in de-inking operations (Honeysett, p. 7).**
- **1962: The average loading on Machine No. 4 was roughly 10 percent long fiber kraft to 90 percent de-ink magazine (S19585).**

During the period of de-inking, the remainder of the stock used by the Mill consisted primarily of virgin pulp (30-60 percent) (see Table 6), wet lap (virgin pulp purchased from a Detroit sulfite pulp mill), and recycled (not de-inked) wastepaper consisting of envelope clippings and internally generated broke (Kauffman Affidavit). While we found no records that provided specific amounts of external unprinted wastepaper that was recycled (not de-inked), Table 5 indicates the amount of broke and trim generated. From reviewing this information, and the pulp and paper stock data in Table 3, it appears that recycling internal broke and trim provided approximately 5 to 20% of the total fiber furnish to the papermaking process.

During the last quarter of 1962, the de-inking process was phased out. As a result, inventories of wastepaper used as input to the de-inking process decreased dramatically and the amount of purchased pulp used increased accordingly (S00983). By January of 1963, the amount of internally generated, de-inked pulp used for paper production was reduced to zero. In contrast, during this same time period, the amount of paper produced remained constant and the amount of purchased pulp used for paper production nearly doubled (061355-061366; S00983; S06464). After January of 1963, de-inked pulp was no longer generated at the Mill (S00983; S19667;

S19692-S19694). It appears that de-inking was discontinued at the Mill for a number of financial and business reasons. Weyerhaeuser acquired Hamilton Paper Company in 1961 (S00053; S00957; BBL, pp. 3-27, 1992) so the Mill could serve as an outlet for the virgin pulp Weyerhaeuser produced at its other papermaking facilities (Carl Gren, p. 73, 1997; Kauffman Affidavit). In addition, the Mill realized that discontinuing deinking would help to reduce solids and BOD loadings to the wastewater treatment system and the Kalamazoo River (S22090-S22091).

After de-inking ceased, the furnish consisted primarily of purchased virgin pulp. For several years (i.e., 1968, 1973, 1975, 1976, 1978) surveys describe the sole or primary fiber source used by the Mill as purchased virgin pulp or sulfate and sulfite pulp (S21002, S21042, S21251, MDNR005322, S16147, KS01400002).

In addition to virgin pulp, other sources of fiber were used in limited amounts. Internal broke and trim continued to be a source of fiber. In addition, the Mill purchased small amounts of unprinted wastepaper such as envelope clippings, paper plate cuttings, tab cards, broke (bleached kraft and Eastex side rolls), and small amounts of de-ink stock (064717; Burd, p. 26, 1997; Gren, pp. 35-36,73, 76, 1997; Honeysett, pp. 18-19, 1997; Kauffman Affidavit). The available records are as follows:

- **1970 (approximately): On one machine, the stock used was nearly 100 percent virgin fiber. The other machine also used internal and some purchased writing/ledger broke (Honeysett, pp. 14-15).**
- **Mid-1970s: Secondary sources of fiber include roll stock, bleach board, SBS, sulfide bleach board (broke from other mills) (Burd, pp. 29-33). Honeysett describes broke purchased during this period as from Federal Board and Perry Cobley, and as East Texas side-run rolls (Honeysett, p. 18, 1997).**
- **1974: Softwood of "milk carton" grade (S20682).**
- **1976: Bleached kraft, sulfate and sulfite pulp, secondary and recycled fibers, tab cards, returned broke (internal), plate cup stock and de-inked pulp (S19918; S21042; S21376; S19832; Gren, p.76-77; Honeysett, p. 18). Wastepaper was not used on a continuous basis (S19918).**
- **1977: Bleached board of "C Grade" (S14210).**
- **1978: Bleached board side rolls of "Kraft" grade, "Blash" dried broke from Westvaco, and uncoated bleach board of "C Grade" were also purchased (S21251; S21522; S21526; S21528).**
- **1980: All virgin pulp (Lawton, p.18).**

The Mill **increased the amount of** purchased pulp and **added** bleached kraft side rolls as a fiber source after 1962 (**Table 10;** S22089-S22091). These changes (eliminating de-inking and utilizing a better fiber source) reduced the BOD emissions to the Kalamazoo River from the Mill by 12,000 pounds/day and helped them to meet stream standards required by the Michigan WRC (S22089-S22091).

After de-inking was eliminated, other notable changes occurred within the Mill's paper production operation. Between 1963 and 1965, **new** save-alls were added to all three paper machines, **replacing older save-alls that had been in place since at least 1950 (064069; Kauffman Affidavit; S24499)**. Save-alls separated solids (fibers) from the process wastewater (MDNR000210; S19725; S19916; S21375; S24653; S24658). The concentrated filtrate from the save-alls (i.e., the process stream that contained the concentrated fibers, commonly referred to as cloudy water) was introduced back into the process and, thus, this can be considered another method of recycling. The clear filtrate from the save-alls (commonly referred to as clear water) was also recycled when possible. By February of 1965, the Mill's facilities were modified to once again include coated paper production facilities (paper coating facilities were also operated from 1940 to 1948) (S00034). This modification greatly extended the range of paper grades produced by the Mill. From the available information it appears that, in the mid-to-late 1970s, there was an increased effort to purchase stock (unprinted paper material) for the recycling process (Burd, pp. 31, 53, 1997; Honeysett, pp. 14, 18, 1997; S14210; S14323; S19832; S19916-S19939; S21376; S21521-S21522; S21526; S21528).

In addition to operating de-inking and recycling processes, the Mill operated a wastewater treatment plant as part of the paper production process. Prior to 1947, all process water was released directly to the Kalamazoo River. In 1947, a pilot waste treatment plant with a 60,000 gallon per day (gpd) capacity was constructed and operated through 1948 (S24495-24500). From 1950 to 1951, a 500,000 gpd (26' diameter clarifier) primary treatment system and a 170,000 gpd secondary (biological) treatment system with secondary clarification (16' diameter clarifier) and secondary sludge thickening was in operation (0064341-0064360). Use of the treatment system continued through at least 1952 (S24500). The Mill began a full-scale operation by installing a 55' diameter primary clarifier that started up in July of 1954 (S24498). Beginning in 1955, sludge generated by the clarifier was pumped to dewatering lagoons, held there, and then transported to the 12th Street Landfill for disposal. From August to September of 1959, an aeration pond pilot plant was operated by the Kalamazoo River Improvement Company and the Mill (S22086). From June 1965 until at least November 1965, an aeration pond pilot plant with a secondary settling tank was operated by the Mill (S22086). To further improve wastewater treatment efficiency, a secondary clarifier with an aerated stabilization pond was added to the system in 1967 (S24577). These improvements were recognized as being innovative and state-of-the-art by both industry and the Michigan WRC (MWRC) (S00290; S24649).

In January of 1981, a new 100' diameter primary clarifier was started to replace the previously existing 1954 primary clarifier. In August of 1981, a sludge dewatering plant was completed and began operating. As a result, the dewatering lagoons and the 12th Street Landfill were no longer used (BBL, p. 3-30, 1992; Lawton, p. 37, 1997; S00003). Disposal of wastewater sludge at the

12th Street Landfill ceased, and all sludge generated after this time was disposed of at off-site commercial landfills (S07280; S00332; S00735; S12273). The sludge dewatering plant was in operation until the Mill closed in November of 2000.

In addition, in February of 1984, a new wastewater treatment plant began operation (S20133). The design included the abandonment of the previous aerated stabilization pond and construction of a two-stage aeration tank system. Nutrients were supplied to both tanks in the form of ammonia and phosphoric acid. A new 95-foot diameter, 12-foot deep secondary clarifier was installed to replace the previously existing 1967 secondary clarifier. The wastewater treatment plant continued to operate until the Mill closed in November of 2000.

d) Each product produced, in whole or in part, at the production facility. Please include dates of production for each product.

- Prior to 1964, the Mill was primarily a manufacturer of uncoated printing (mostly for books) and writing grades of paper (S20128; S20132).
- From December of 1964 to February of 1965, the Mill's facilities were modified to include coated paper production facilities. This extended the range of printing grades (mostly for books and commercial publications) produced by the Mill and initiated the production of technical, specialty papers (i.e., release backing, electrophotographic base, and outer wax laminated papers).
- Since 1966, coated paper has constituted approximately one third of total production (Lawton, pp. 74-75, 1997; Responses to 2nd Interrogatories, p. 6, 1997).
- In 1969, the production grades at the Mill included English Finish Book, Machine Finish Book, Machine Finish Litho, SC Book, Antique Book, Tub Sized Offset, Bond, Mimeograph, Duplicator Tablet, Writing, Catalogue, Bible papers, Colored Covers, Vellums, Index, Vellum-Bistrol and Post (064354). By 1971, improved fine paper grades (specialty papers such as release coated, release base, and, sandpaper backing) were much more predominant at the Mill (064372).
- In 1971, 1973, and 1976, an industrial grade of paper was also produced at the Mill (KS01400002; S14994; S19826). **This category of paper, used in EPA surveys, is a market-based term, and can include a wide range of paper types and grades.**

e) Any and all activities or efforts to take production facilities out of operation, including without limitation the cessation, decommissioning, containment, demolition, or deconstruction of any production facility, and the dates thereof.

1963: (January) The de-inking of wastepaper was completely discontinued (S00983; S19667; S19692-S19694).

Following cessation of de-inking operations, the 16' diameter hydropulper that was used for the de-inking process was rebuilt and subsequently used for preparing virgin and recycled pulp (Gren, p. 64, 1997).

1970: (August-December) The Mill was closed and all paper production ceased due to a strike by Mill employees (S20125-S20126; S20139).

(December) Paper machine No. 4 was started up again (S15125; S15152).

1971: (March) Paper machine No. 3 was started up again (S15125; S15152; S19885).

1972: (October) Paper machine No. 2 was started up again (S15125; S15152).

1975: (January) Paper machine No. 2 was shut down (S19885; S19917; S19997; S20063; S21375).

1977: (July) After being rebuilt, paper machine No. 2 was started up again (S19885; S19917).

1981: Original primary clarifier was torn down (replaced by a new 100' diameter primary clarifier), and the use of dewatering lagoons was discontinued (BBL, p. 3-33, 1992; S00003).

1983: Residuals from the dewatering lagoons were consolidated into four lagoons.

1984: The secondary clarifier was taken out of service (replaced by a new 95' diameter secondary clarifier), and the aeration basin was partially backfilled and replaced with an alternate treatment system (BBL, p. 3-29, 1992).

The four lagoons and the 12th Street Landfill were covered with dirt and gravel and seeded in accordance with agreements with Michigan Department of Natural Resources (MDNR) (BBL, p. 3-30, 1992; Lawton, p. 37,1997; S00003).

f) Any remediation or removal activities potentially involving PCBs or PCB-containing materials that are not addressed in Questions 29 and 40, below, including without limitation any clean-up, containment, or disposal activities or efforts, and the dates thereof.

None, other than those addressed in the responses to Questions No. 29 and 40.

g) Describe all types of analytical testing performed at each stage in the paper production, recycling (including de-inking), and waste handling processes, including test methods, media tested, and time periods thereof.

Paper production

- Pulp was tested in the wet lab for moisture content using a "consistencies" test and a "freeness" test. These tests were performed before paper went on the head box of the paper machine (Gren, pp. 21-22, 27, 1997).
- In the dry lab, paper off the machine was tested for strength (using the "mullen test"), tensile, tear, fold, thickness, color, density, brightness, opacities, and weight. A "wax test" and acid test were also performed (Gren, pp. 26-28, 1997; Honeysett, pp. 11-12, 1997).

Recycling/de-inking

- During the bleaching process, the amount of bleach used was adjusted according to brightness tests (Gren, pp. 30-31, 1997).
- The amount of chlorine was also measured (Gren, pp. 30-31, 1997).

Wastewater Effluent

Testing Conducted by the Mill:

- The Mill conducted a number of pilot studies, demonstration studies, and full scale trials for the treatability and design of de-inking wastewater treatment facilities from 1947 through 1953. As a part of these studies, various measurements were taken, including treatment efficiency, influent and/or effluent TSS and BOD concentrations, flow rates, and sludge dewatering and disposal from the Mill's de-inking operations (0064474-0064480; 0064485-0064523; 0064624-0064679; S24499-S24500). A number of treatment options were examined with primary clarification for TSS removal as the first step. Suspended solids removal efficiencies ranged from approximately 40% in early tests to 80 to 90% in later tests (0064487). An array of secondary or biological waste treatment options to remove BOD were evaluated followed by the sludge dewatering, handling, and disposal options. In addition to BOD and TSS, pH and volatile or ash content of the waste streams and sludge generated from the Mill's treatment trials were examined to develop the fundamental wastewater treatment data needed to design primary clarification and sludge handling.
- From 1955 to 1990, the influent and effluent (Outfall 005) and Sewer No. 2 (Outfall 002) of the wastewater treatment process underwent periodic testing for flow, biochemical oxygen demand (BOD), total suspended solids (TSS), total dissolved solids (TDS), total volatile solids(TVS), and PCBs (effluent only). The available results from these tests are presented in Tables 1 and 2. **We found no TDS data for the period during which de-inking occurred.**
- From 1957 to 1983, the effluent discharged from Outfalls 002, 003, and 004 underwent periodic testing for flow, BOD, TSS, TDS, and TVS. The available results from these tests are presented in Table 2. **We found no TDS data for the period during which de-inking occurred.**
- In 1972, the Mill wastewater was analyzed for hardness, iron, copper, dissolved solids, and sulfates (S20033).
- According to a 1976 survey, laboratory testing procedures for annual reporting evaluated the following components of the Mill's wastewater effluent:
  - Temperature was measured in degrees Fahrenheit (°F). A glass electrode, standardized daily, was used to measure pH.
  - Suspended solids (SS) were assessed using glass fiber standardization methods, testing 25 ml at 105 °F. Five-day BOD was measured using 3 dilutions of municipal seed and standard methods for the seed procedure. Dilutions used standard methods ingredients, including purchased distilled water.

- Dissolved oxygen (DO) was measured with the electrode (YSI) method, which was standardized daily using the Winkler method. Incubation temperature was set at 20 degrees Celsius (°C) and checked daily during the typical 5-day BOD incubation period.
- Turbidity was measured with a turbidimeter, using the Hach-Formizan standardization method (S19842-S19843).

- In 1976, the analytical procedures used for BOD and TSS measurement were in accordance with the methods presented in Standard Methods for the Examination of Water and Wastewater, 13th edition. Measurements were compared to an analyzed glucose-glutamic acid BOD standard (S20027-S20028). BOD analysis was conducted semi-annually, and the average percentage difference between tested BOD and the glucose-glutamic acid standard was 5 – 10% (S20028).
- As of 1976, the effluent from the boiler plant to the sewer, considered uncontaminated cooling water, was sampled and analyzed weekly.
- By 1977, the wastewater was sampled at 6 locations, including well water, and analyzed for up to 15 chemical elements and compounds (S20038).

Testing Conducted by Others:

The MDNR conducted external Industrial Wastewater Surveys, which consisted of physical, chemical, and bacteriological analyses of individual and composite grab samples of primary and secondary clarifier effluents and cooling discharges, including the following:

- In 1955, the MDNR/Water Resources Commission (WRC) analyzed a 24-hr composite sample from Outfall 005 for flow, BOD, and TSS (S24498).
- In 1957, MDNR/WRC analyzed two samples from Outfall 005 for flow, BOD, and TSS (S22085).
- In 1957, MDNR/WRC analyzed two 24-hr composite samples each from Outfalls 002 and 005 for flow, BOD, TSS, and TVS (S22497).
- In 1959, MDNR/WRC analyzed two 24-hr composite samples each from Outfalls 002 and 005 for flow, BOD, TSS, and TVS (S24496).
- In 1961, MDNR analyzed one 24-hour composite sample of the clarifier effluent and one 24-hour composite grab sample (hand-composited from grab samples) of the white water for flow, BOD_5, SS, suspended volatile solids, and pH (KJ00800078).
- In 1968, MDNR analyzed two 24-hour composite samples of "primary effluent" (primary clarifier) and "secondary effluent" (final clarifier) for flow, pH, BOD_5, COD, SS, suspended volatile solids, settleable solids, total phosphorus, soluble phosphorus, nitrate nitrogen, ammonia nitrogen, organic nitrogen, and turbidity (S16149);
- In 1968, MDNR analyzed a grab sample from the "sump pit emergency sewer" for flow, pH, BOD_5, SS, suspended volatile solids, and settleable solids (S16150);
- In 1968, MDNR analyzed two grab samples from "treatment plant effluent to the River" for total coliform and fecal coliform (S16150);

- In 1973, MDNR analyzed two 24-hour composite samples of clarifier effluent (#030049) for flow, pH, BOD_5, COD, total solids, TVS, total non-volatile solids, SS, suspended volatile solids, dissolved solids, dissolved volatile solids, dissolved non-volatile solids, settleable solids, total phosphorus, soluble orthophosphate, nitrate nitrogen, ammonia nitrogen, organic nitrogen, antimony, cadmium, copper, total chromium, phenols, and turbidity (KS01400004);
- In 1973, MDNR analyzed two 24-hour composite samples from "Cooling Discharge #2" for flow, pH, BOD_5, COD, total solids, SS, suspended volatile solids, suspended non-volatile solids, dissolved solids, total phosphorus, nitrate nitrogen, antimony, cadmium, copper, total chromium, and turbidity (KS01400005);
- In 1973, MDNR analyzed two 24-hour composite samples from "Cooling Discharge #3" for flow, pH, BOD_5, COD, total solids, SS, suspended volatile solids, suspended non-volatile solids, dissolved solids, total phosphorus, nitrate nitrogen, antimony, cadmium, copper, total chromium, and turbidity (KS01400006);
- In 1973, MDNR analyzed two 24-hour composite samples from "Cooling Discharge #4" for flow, pH, BOD_5, COD, total solids, SS, suspended volatile solids, suspended non-volatile solids, dissolved solids, total phosphorus, nitrate nitrogen, antimony, cadmium, copper, total chromium, and turbidity (KS01400007);
- In 1973, MDNR analyzed several grab samples from clarifier effluent #030049, Cooling Discharges #2, #3, and #4 for BOD_5, total coliform, and fecal coliform (KS01400008);
- In 1973, MDNR analyzed a 48-hour "grab composite" sample from clarifier effluent #030049 for PCBs and phthalates (KS01400009);
- In 1975, MDNR analyzed one 24-hour composite sample from Outfall 005 (#030049) for flow, pH, BOD_5, COD, total solids, TVS, SS, suspended volatile solids, dissolved solids, dissolved volatile solids, settleable solids, total phosphorus, soluble orthophosphate, nitrate nitrogen, ammonia nitrogen, organic nitrogen, phenols, PCBs, dibutyl phthalate, benzyl butyl phthalate, and bis(2-ethylhexyl)phthalate (S21003);
- In 1975, MDNR analyzed one 24-hour composite sample from Outfall 002 (#030052), Outfall 003 (#030136), and Outfall 004 (#030135) for flow, pH, BOD_5, COD, total solids, TVS, SS, dissolved solids, total phosphorus, soluble orthophosphate, nitrate nitrogen, ammonia nitrogen, organic nitrogen (S21003-S21004);
- In 1975, MDNR analyzed several grab samples from Outfall 005 (#030049), Outfall 002 (#030052), Outfall 003 (#030136), and Outfall 004 (#030135)for BOD_5, pH, oil, temperature, total coliform, and fecal coliform (S21004);
- In 1976, MDNR analyzed one 24-hour composite sample from Outfall 002 (#030052), Outfall 003 (#030136), Outfall 004 (#030135), and 005 (#030049) for flow, BOD_5, COD, SS, dissolved solids, settleable solids (Outfall 005 only), total phosphorus, nitrite and nitrate nitrogen, ammonia nitrogen, organic nitrogen, chlorides, sulfates, total lead (Outfall 005 only), PCB 1242, PCB 1254, and PCB 1260 (S21043-S21044);

- In 1976, MDNR analyzed two grab samples each from Outfall 002 (#030052), Outfall 003 (#030136), Outfall 004 (#030135), and 005 (#030049) for flow, temperature, pH, oil and grease, BOD_5, SS, orthophosphate, total phosphorus, nitrite and nitrate nitrogen, ammonia nitrogen, organic nitrogen, and dissolved oxygen (S21044);
- In 1978, MDNR analyzed one 24-hour composite sample from Outfall 005 (#030049) for flow, BOD_5, COD, SS, dissolved solids, total phosphorus, nitrite and nitrate nitrogen, ammonia nitrogen, organic nitrogen, chlorides, sulfides, sulfates, cyanides, phenols, total cadmium, total chromium, total lead, total zinc, total arsenic, magnesium, PCB 1242, PCB 1254, and PCB 1260 (S21253);
- In 1978, MDNR analyzed one 24-hour composite sample from Outfall 004 (#030135) for flow, BOD_5, COD, SS, dissolved solids, total phosphorus, nitrite and nitrate nitrogen, ammonia nitrogen, organic nitrogen, chlorides, sulfates, PCB 1242, PCB 1254, and PCB 1260 (S21253);
- In 1978, MDNR analyzed two grab samples each from Outfall 005 (#030049) and Outfall 004 (#030135) for temperature, pH, oil and grease, BOD_5, SS, dissolved solids, total phosphorus, nitrite and nitrate nitrogen, ammonia nitrogen, organic nitrogen, chlorides, and sulfates. Outfall 005 was also analyzed for settleable solids, magnesium, cadmium, chromium, lead, zinc, and arsenic (S21254);
- In 1982 (as reported in a 1985 survey), MDNR analyzed two 24-hour composite samples from Outfall 005 (#030049) for flow, SS, dissolved solids, settleable solids, TOC, total phosphorus, nitrite and nitrate nitrogen, ammonia nitrogen, Kjeldahl nitrogen, total aluminum, total cadmium, total chromium, total copper, total lead, total nickel, and total zinc (S21555);
- In 1985, MDNR analyzed one 24-hour composite sample each from Outfall 005 (#030049) and Outfall 004 (#030135) for flow, BOD_5, $CBOD_5$ (Outfall 005 only), SS, dissolved solids, settleable solids (Outfall 005 only), TOC, total phosphorus, nitrite and nitrate nitrogen, ammonia nitrogen, Kjeldahl nitrogen, total aluminum, total cadmium, total chromium, total copper, total lead, total nickel, total titanium, total vanadium, total zinc, chlorinated hydrocarbons, PCBs, and organochlorine pesticides (S21551);
- In 1985, MDNR analyzed two grab samples each from Outfall 005 (#030049) and Outfall 004 (#030135) for temperature, pH, chlorine, dissolved oxygen, BOD_5, SS, dissolved solids, total phosphorus, nitrite and nitrate nitrogen, ammonia nitrogen, Kjeldahl nitrogen, oil and grease, chloroform, and other purgeable halocarbons (S21552);
- In 1988, MDNR analyzed one 24-hour composite sample from Outfall 005 (#030027) for flow, BOD_5, $CBOD_5$, $CBOD_{20}$, COD, TOC, SS, dissolved solids, settleable solids, total phosphorus, nitrite and nitrate, ammonia, Kjeldahl nitrogen, alkalinity (as $CaCO_3$), hardness (as $CaCO_3$), calcium, chloride, potassium, magnesium, sulfate, sodium, phenols, total aluminum, total cadmium, total chromium, total copper, total lead, total nickel, total iron, total silver, and total zinc (S13303);
- In 1988, MDNR analyzed three grab samples from Outfall 005 (#030027) for temperature, pH, chlorine, dissolved oxygen, BOD_5, SS, settleable solids, total

phosphorus, nitrite and nitrate, ammonia, Kjeldahl nitrogen, oil and grease. Two of these grab samples were analyzed for phenols, and one of these grab samples was analyzed for total aluminum, total cadmium, total chromium, total copper, total lead, total nickel, total iron, and total zinc (S13304);

- In 1988, MDNR analyzed two grab samples from Outfall 005 (#030027) for purgeable halocarbons, purgeable aromatic hydrocarbons, chlorinated hydrocarbons, PCBs, and organochlorine pesticides (S13305-S13306);
- In 1990, MDNR analyzed one 24-hour composite sample from Outfall 005 (#030027) for flow, BOD_5, COD, TOC, SS, total phosphorus, nitrite and nitrate, ammonia, Kjeldahl nitrogen, chloride, phenols, total cadmium, total chromium, hexavalent chromium, total copper, total iron, total lead, total mercury, total nickel, total silver, and total zinc (S13158); and
- In 1990, MDNR analyzed two grab samples from Outfall 005 (#030027) for temperature, pH, chlorine, dissolved oxygen, BOD_5, COD, TOC, SS, total phosphorus, nitrite and nitrate, ammonia, Kjeldahl nitrogen, and chloride. One of these grab samples was also analyzed for phenols, total cadmium, total chromium, hexavalent chromium, total copper, total iron, total lead, total mercury, total nickel, total silver, and total zinc (S13159).

The results from WRC and MDNR testing are reported in Tables 1 and 2 in response to Question Nos. 26 (e) and 28 (d)(ii) for the following parameters: flow, BOD, TSS, TDS, TVS, and PCBs.

II. Questions Concerning Pulp Production Processes

Processes Descriptions

Question No. 4: De-inking Processes Description

Please identify and describe any and all de-inking operations that occurred on your property, including:

a) The nature of the processes.

De-inking is a process of removing ink from printed wastepaper. The de-inked, pulped wastepaper can then be used to produce new, quality paper products.

At the Mill, externally generated wastepaper used as stock for pulp production typically consisted of books, magazines, and office materials (Gren, pp. 11-12, 1997; Responses to 2nd Interrogatories, p. 5, 1997). **At least 90 percent of the de-ink stock consisted of #1 heavy book and magazine wastepaper (nearly all of which was magazine). Up to 10 percent of the remaining wastepaper furnish was made up of ledger paper that was used to "sweeten" the stock (Kauffman Affidavit).** Some or all of this material was de-inked. Before January of 1963, when the Mill completely ceased all de-inking activities, wastepaper used at the Mill as stock for de-inking may have contained some NCR paper (Gren, pp. 14-15, 1997; Responses to 4th Interrogatories, p. 5, 1997).

Former employees recalled seeing some NCR forms in the wastepaper stream (Lawton, pp. 74-75, 1997). However, there is evidence that the Mill consciously attempted to avoid the use of NCR paper in its manufacturing process for reasons unrelated to the potential presence of PCBs. Employees routinely removed latex containing items, such as envelopes and NCR paper, because the latex would obstruct the machinery (Gren, p. 14-15, 1997). In addition, the goldenrod type of NCR paper could not be bleached and, therefore, was not suitable stock for the paper making process (Gren, p. 14, 1997).

b) The physical operations that constituted those processes.

Wastepaper for the de-inking process was delivered to the Mill in bales. This wastepaper consisted largely of two general types of paper: books and magazines, and office materials (Gren, pp. 11-12, 1997; Responses to 2nd Interrogatories, p. 5, 1997). Bales of wastepaper were unbaled onto a conveyor belt and hand sorted, removing non-pulpable items such as metals and plastics (Burd, pp. 6-7, 1997). As mentioned in 4(a), latex containing materials (including NCR paper) were also removed. Sorted paper was then placed into a 16-foot diameter hydropulper, the larger of two hydropulpers the Mill operated (Gren, p. 14, 1997), where a petroleum-based additive used for de-inking and steam were added (Gren, p. 77, 1997). **Wastepaper that was removed, including NCR to the extent that any post-consumer NCR forms contained in the wastepaper furnish, was re-baled and sold back to wastepaper suppliers (Kauffman Affidavit).** De-inking equipment was cleaned with caustic soda (Responses to 2nd Interrogatories, p.5, 1997). During the period from May 1961 through December 1962, de-inking was gradually phased out at the Mill. This is supported by the pulp and paper sources used by the Mill (see Table 6). De-inking completely stopped in January 1963.

Prior to 1957, bleaching of pulp was accomplished consistent with industry standards by a cooking process within the hydropulper. This process involved mixing the stock with caustic soda (Gren, p. 30, 1997) and adding a bleaching agent (Burd, pp. 14,47, 1997; Gren, p. 30, 1997). The bleaching agents used during this time included chlorine or hydrosulfite (Burd, p. 14, 1997; Gren, p. 30, 1997; Responses to 2nd Interrogatories, p. 5, 1997). After being bleached in the hydropulper, the pulp was pumped to a storage chest and then to incline washers, which had a series of screens that would remove everything but fiber (Burd, p. 13, 1997; Honeysett, p. 22, 1997). The pulp was then deposited into a blend chest for blending prior to paper production.

In 1957, the bleaching process was changed by the addition of a bleaching tower (S20123-S20124; Burd, pp. 14,47, 1997; Gren, p. 30, 1997). Calcium hypochlorite became the bleaching agent of choice (S20123-S20124). The flow of the process was also changed at this time as bleaching no longer occurred within the hydropulper. In the new process, after the incline washers, the material was deposited into a storage chest. The pulp then moved into the bleaching tower, where it was bleached. The pulp was then pumped to a second set of incline washers and placed into a final storage chest prior to being blended for paper production (Burd, p. 13, 1997; Responses to 2nd Interrogatories, p. 5, 1997).

c) The dates of such operations.

The de-inking plant was already operating in 1954. De-inking ceased completely in January of 1963 (S00983; S19667; S19692-S19694). (NCR paper, which had PCBs, was in the market from 1954 until the early 1970s (Wisconsin Department Natural Resources, 1998)).

d) The nature and dates of significant changes to those operations.

<u>1954 through 1985</u>

1957: A new, hypochlorite bleaching tower was added (S20123-S20124). This tower used calcium hypochlorite as the bleaching agent. Sulfur dioxide was added to the system if the residual chlorine level reached unacceptable levels (Gren, p. 31, 1997). Also, a second set of incline washers was added to the process after the bleaching step.

1963: The Mill ceased de-inking completely in January of 1963 (S00983; S19667; S19692-S19694).

<u>Question No. 5: Recycling Processes Description</u>

Please identify and describe any and all recycling operations (other than de-inking) that occurred on your property, including:

a) The nature of the processes.

The Mill used external and internal sources of unprinted wastepaper as stock in its recycling (other than de-inking) process. This included, but was not limited to, roll stock, bleach board, sulfide bleach board (paper plates), used tab cards, and internal and external sources of trim and broke.

During the mid-1950s, one source indicates that the recycling process occurring at the Mill included the return of paper shavings, or trim, to a beater or the smaller of two hydropulpers at the Mill (Gren, p. 20, 1997). This process also included the recycling of **envelope clippings and internal** broke.

After de-inking ceased completely in January 1963, the Mill **continued to recycle internal broke and trim. In addition, the Mill purchased small amounts of unprinted wastepaper such as envelope clippings, paper plate cuttings, tab cards, broke (bleached kraft and Eastex side rolls), and small amounts of de-ink stock (064717; Burd, p. 26, 1997; Gren, pp. 35-36,73, 76, 1997; Honeysett, pp. 18-19, 1997; Kauffman Affidavit).** This wastepaper did not require de-inking, and was processed the same way as the wood pulp (Gren, pp. 35-36, 73, 1997; Responses to 2nd Interrogatories, p. 5, 1997).

One additional practice at the Mill that could be considered recycling was the installation of "save-alls" on the paper machines. Save-alls were used **at the Mill since at least 1950 (064069; Kauffman Affidavit;** S24499). However, the Mill's practice of white water reuse and the presence of white water capture tanks is documented back to 1944 (S24487-S24488). Save-alls were placed under the paper machines to trap fiber from the wastewater. The fiber was returned to a chest to be re-used in the paper production process (Honeysett, p. 41, 1997; Burd, p. 45, 1997; Responses to 2nd Interrogatories, p.5, 1997).

b) The physical operations that constituted those processes.

Broke and "shavings off the rewinder" (i.e., trim) would be re-pulped in a beater or hydropulper and then blended with other pulp (Gren, p. 20, 1997). Colored recycling stock (usually some portion of the broke or wastepaper) had to be bleached prior to going into the papermaking process. This included cooking the broke and/or the wastepaper in a cooker beater and adding a bleaching agent (e.g., hypochlorite); it did not include the introduction of oil (petroleum-based additive) used in the de-inking process (Gren, p. 77, 1997).

c) The dates of such operations.

It appears that recycling operations (other than de-inking) occurred during the entire relevant time period (1954 through 1985) (Burd, p. 31, 53, 1997; Gren, pp. 19-20, 77, 1997; Honeysett, p. 9,45, 1997; Responses to 2nd Interrogatories, p. 5, 1997; Responses to 4th Interrogatories, p.4, 1997).

d) The nature and dates of significant changes to those operations.

<u>1954 through 1985</u>

1963: "New Impco Disc Save-Alls" were installed on Machines No. 3 and 4 (MDNR000210; S19916; S21375; Responses to 2nd Interrogatories, p. 5, 1997).

1965: A "used Dorr-Oliver Disc Save-All" was installed on Machine No. 2 to allow collection and re-use of fibers and white water (S19725; S24653; S24658; Responses to 2nd Interrogatories, p. 5, 1997).

<u>Question No. 6: Other Pulp Production Processes Description</u>

Please identify and describe any and all pulp production operations, other than those provided under Questions 4 and 5, that occurred on your property, including:

a) The nature of the processes.

b) The physical operations that constituted those processes.

c) The dates of such operations.

d) The nature and dates of significant changes to those operations.

We found no evidence of pulp production at the Mill other than the de-inking and recycling processes mentioned in response to Questions No. 4 and 5. However, it should be noted that the Mill used a substantial portion of external virgin pulp (30-100% of stock) in its paper production process (**Table 6; Gren, pp. 35-36, 1997; KS01400002; Lawton, p. 18, 1997; S21002; S21042; S21251; MDNR005322; S16147**).

Pulp Production Inputs: De-inking Processes

<u>**Question No. 7: Stock Sources**</u>

> **Please describe with specificity the type and amount of all stock (e.g., wastepaper, mixed office waste, NCR paper broke, newsprint, OCC, DLK, chips, NCR converter trim, etc.) used in the de-inking processes. For each of the types listed, please provide the following information (and reference any and all records, contracts, or other documents that indicate):**

The type of stock used in the de-inking process consisted of external sources of magazines (Burd, p. 7, 1997; Gren, pp. 11-12, 1997; Honeysett, p. 6, 1997; Responses to 2nd Interrogatories, p. 5, 1997; 0064341-0064360; S19585-S19586), books (Gren, pp. 11-12, 1997; Responses to 2nd Interrogatories, p. 5, 1997) and office paper (which may have contained carbonless copy paper) (Burd, p. 7, 1997; Gren, pp. 11-12, 1997; Responses to 2nd Interrogatories, p.5, 1997). **At least 90 percent of the de-ink stock consisted of #1 heavy book and magazine wastepaper (nearly all of which was magazine). Up to 10 percent of the remaining wastepaper furnish was made up of ledger paper that was used to "sweeten" the stock (0064488; Kauffman Affidavit; Honeysett, p. 7, 1997). Types of ledger** wastepaper that were used, and may have required de-inking, included, but were not limited to, sheet paper, 'multi-form' forms, colored manifold, white manifold bond paper, multiple collated and continuous feed paper (Burd, p. 7, 1997).

a) For each month in operation, the source(s) (internal and external) of the stock used in the de-inking processes.

No stock requiring de-inking was generated internally. We found no information on the specific external sources for the types of stock used in the de-inking process.

b) Whether stock was sorted before use in the de-inking processes and if so, by what method.

Bales of wastepaper that arrived at the Mill were typically uniform in nature, and would contain either paper that required de-inking or paper that required only recycling (other than de-inking). Wastepaper that required de-inking was unbaled onto a conveyer belt and hand sorted, removing non-pulpable and non-bleachable items such as metals, plastics, and latex containing materials such as goldenrod NCR paper (Burd, pp. 6-7, 1997; Gren, p. 14, 1997). The Mill consciously attempted to avoid the use of NCR paper because it contained latex, which would obstruct the machinery (Gren, p. 14-15, 1997). In addition, the goldenrod type of NCR paper could not be bleached. Thus, goldenrod NCR paper was not suitable stock for the paper making process both because it contained latex and because it could not be bleached (Gren, p. 14, 1997). **Wastepaper that was removed, including NCR to the extent that any post-consumer NCR forms**

contained in the wastepaper furnish, was re-baled and sold back to wastepaper suppliers (Kauffman Affidavit).

c) **For each month in operation, the average amount of the material used in the de-inking process on a tons per day basis. Please report amount on a moisture basis (e.g., air-dry tons, bone-dry tons, or actual percent moisture).**

Information concerning the amounts of paper stock used in either or both the de-inking process and recycling process was reported only as "tons" and gave no indication of moisture content. Monthly quantities of total paper stock used for pulp production between 1954 and 1962 are presented in Table 3. The reported amount of paper stock includes stock requiring de-inking and stock merely requiring recycling, without distinction.

d) **The capacity for de-inking, estimated on a tons per day basis. In addition, please report actual production figures, where available. Please report capacity and other amounts on a moisture basis (e.g., air-dry tons, bone-dry tons, or actual percent moisture). Please include information on the capacity for inputs to the processes. "Capacity" is defined as the amount of wastepaper inputs that the process can handle.**

We found no information on the capacity for de-inking. **Limited** information does exist concerning the amount of pulp produced by the de-inking process (without any indication of moisture content). In 1950, the average de-inking rate at the Mill varied from a low of 300 ton/month to an average of 900 tons/month according to the Water Resources Commission (S24498-S24500). A value of 50 t/d was reported for 1960, and a value of 60 t/d was reported for 1961-1963 (KG01600058). **Based on the diverse nature of the wastepaper furnish and that internal broke and trim could have been re-pulped in either the recycling or de-inking hydropulper,** these production values likely include some pulp produced from unprinted, as well as printed, paper stock.

e) **For each month in operation, any and all information on the PCB content of the materials used in the de-inking processes.**

We found no information on the PCB content of the materials used in the de-inking process.

f) **For each month in operation, any and all information on the type and amount of chemicals (e.g., bleaching agents, caustic, solvents, detergents, etc.) used in the de-inking process.**

Table 3 reports the amount of bleaching agent used per month for part of 1961 and all of 1962. Some of the bleaching agent was used in the de-inking process and some in the recycling process.

g) **For each month in operation, the relative percentage for each type of stock used in the de-inking process.**

We found no information concerning the relative percentages of each type of stock used in the de-inking process.

Question No. 8: Water Sources

Please list the type and amount (on a million gallons per day basis) of all water sources used in the de-inking processes. For each of the sources listed, please provide the following information (and reference any and all records, water bills, or other documents that indicate):

(a) **For each month in operation, the average amount of water used in the de-inking processes on a million gallons per day basis.**

b) **Identify what type of treatment, if any, was used to treat the raw process water.**

c) **For each month in operation, any and all information on the PCB content of the water used in the de-inking processes.**

We found no information about the water sources used specifically in the de-inking process (i.e., the average amount of water used, the type of treatment used for the raw process water, or the PCB content of the water used in this process). The Mill used ground well water as process water for the entire paper making process. Information concerning this process water can be found in the answer to Question No. 24. **It appears that the source of some water used in the de-inking process was recycled white water from the paper machines (Gren, p. 53, 1997). However, no detailed information (amount, etc.) is available for this recycled water.**

Pulp Production Inputs: Recycling Processes

Question 9: Stock Sources

Please describe with specificity the type and amount of all stock (e.g., wastepaper, mixed office waste, NCR paper broke, newsprint, OCC, DLK, chips, NCR converter trim, etc.) used in the recycling processes (other than de-inking). For each of the types listed, please provide the following information (and reference any and all records, contracts, or other documents that indicate):

The type of stock used in the recycling process consisted of **internal** "broke," "trim" **and** stray fibers. **In addition, the Mill purchased small amounts of unprinted wastepaper such as envelope clippings, paper plate cuttings, tab cards, broke (bleached kraft and Eastex side rolls) (064717; Burd, p. 26, 1997; Gren, pp. 35-36,73, 76, 1997; Honeysett, pp. 18-19, 1997; Kauffman Affidavit)** As discussed in the response to Question No. 3 (c), broke refers to parts of manufactured sheets of paper that have been returned to the process. Trim refers to pieces, or shavings, that are trimmed off the manufactured sheets in the finishing process. Stray fibers refer to the fibers trapped in the save-alls. EPA survey data from 1976 indicates that wastepaper was not used "on a continual basis" (S19918). **There is no indication that what was considered "post-consumer" wastepaper was used during the relevant time period (Burd, p. 31, 1997).**

a) **For each month in operation, the source(s) (internal and external) of the stock used in the recycling processes.**

- During the mid-1950s, the recycling process occurring at the Mill included the return of paper shavings (i.e., trim) to the hydropulper or beater from the Mill processes (Gren, p. 20, 1997).
- For the period of 1958 through 1968, paper stock used for the recycling process included internally generated broke (Honeysett, p. 9, 1997).
- After 1962, the Mill added purchased pulp and bleached kraft side rolls as a fiber source (S22089-S22091).
- In 1974, the Mill purchased 1.03 tons of softwood of "milk carton" grade from North American (S20682).
- An undated EPA survey describing activity in 1976 indicates the Mill purchased the following types of stock for recycling from unspecified suppliers:
  - tab cards (softwood) (S21376);
  - tab cards (S19832);
  - returned broke (softwood) (S21376); and
  - plate cup stock (S21376).
- In the mid-1970s, the Mill purchased broke and unprinted paper, including roll stock, bleach board, sulfide bleach board (paper plates) and used tab cards, from a number of companies and mills all over the country (S19916-S19939; Burd, pp. 31, 53, 1997; Honeysett, pp. 14, 18, 1997; Responses to 4th Interrogatories, pp. 3-4, 1997).
- Documents dated 1977 indicate the Mill purchased an unspecified amount of bleached board of "C Grade" from Wellpak, Inc. (S14210).
- Documents dated 1978 indicate the Mill purchased unspecified amounts of the following:
  - Bleached board side rolls of "Kraft" grade from Perkins Goodwin Co. Inc. (S21526);
  - Broke of "Westvaco" grade from Consolidated Fibers (S21522); and
  - Uncoated bleached board of "C Grade" from Wellpak, Inc. (S21528).
- From 1970-1983, stock purchased for the recycling process included tab cards and broke from a variety of facilities, including Federal Paperboard, Perry Cobley, East Texas, and Three Rivers Processing Plant (Honeysett, pp. 18, 50, 1997).

b) Whether stock was sorted before use in the recycling processes and if so, by what method.

It appears that the stock for recycling came in large, uniform bales or units (e.g., purchased broke, bleached board side rolls) and did not require sorting (Gren, pp. 18-19, 1997; S21522).

c) For each month in operation, the average amount of the material used in the recycling process on a tons per day basis. Please report amount on a moisture basis (e.g., air-dry tons, bone-dry tons, or actual percent moisture).

Available information was reported only as "tons" and gave no indication of moisture content:

- For 1954 through 1962, monthly quantities of total paper stock used for pulp production are presented in Table 3. The reported amount of paper stock includes stock requiring de-inking and stock merely requiring recycling, without distinction.
- **For 1957 through 1963, 1966, and 1985, the amount of broke and trim generated at the Mill is presented in Table 5. As there is no indication the Mill sold any of its broke or trim, it can be assumed that it was all recycled. The average amount of broke/trim that was likely recycled was 13 t/d (Table 5).**
- In 1976, as described above in 9 (a), the Mill purchased the following types of stock for recycling from unspecified suppliers; amounts are assumed to be daily averages based on data for the year:
  - 1.98 t/d tab cards (softwood) (S21376);
  - 7.87 t/d tab cards (S19832);
  - 12.80 t/d returned broke (softwood) (S21376); and
  - 6.72 t/d plate cup stock (S21376).

d) The capacity for recycling, estimated on a tons per day basis. In addition, please report actual production figures, where available. Please report capacity and other amounts on a moisture basis (e.g., air-dry tons, bone-dry tons, or actual percent moisture). Please include information on the capacity for inputs to the processes.

We found no information on the capacity for recycling or actual production figures.

e) For each month in operation, any and all information on the PCB content of the materials used in the recycling processes.

An undated survey states that wastepaper suppliers tested for PCBs, which assisted **the Mill** in excluding PCB-containing fibers from their papermaking process (S19448). The survey did not present the results of PCB testing.

f) **For each month in operation, any and all information on the type and amount of chemicals (e.g., bleaching agents, caustic, solvents, detergents, etc.) used in the recycling process, if any.**

As previously mentioned, Table 3 reports the amount of bleaching agent used per month for part of 1961 and all of 1962. Some of the reported amount of bleaching agent was used in the de-inking process and some in the recycling process.

g) **For each month in operation, please provide the relative percentage for each type of stock used in the recycling process.**

We found no information on the relative percentage of each type of stock used in the recycling process.

Question No. 10: Water Sources

Please list the type and amount of all water sources used in the recycling processes (other than de-inking). For each of the sources listed, please provide the following information (and reference any and all records, water bills, or other documents that indicate):

a) **For each month in operation, the average amount of water used in the recycling processes on a million gallons per day basis.**

b) **Identify what type of treatment, if any, was used to treat the raw process water.**

c) **For each month in operation, any and all information on the PCB content of the water used in the recycling processes.**

No documents have been found that contain information about the water sources used specifically in the recycling process (i.e., the average amount of water used, the type of treatment used to treat the raw process water, or the PCB content of the water used in this process). The limited amount of information that is available concerning process water is related to the entire paper making process and can be found in the answer to Question No. 24.

Pulp Production Inputs: Other Pulp Production Processes

Question No. 11: Stock Sources

Please describe with specificity the type and amount of all stock (e.g., virgin fiber, wastepaper, mixed office waste, NCR paper broke, newsprint, OCC, DLK, chips, NCR converter trim, etc.,) used in any pulp production processes (other than de-inking or recycling). For each of the types of stock listed, please provide the following information (and reference any and all records or documents that indicate):

a) **For month in operation, the source(s) (internal and external) of the stock used in the pulp production processes.**

b) **Whether stock was sorted before use in the pulp production processes and if so, by what method.**

c) **For each month in operation, the average amount of the material used in the pulp production process on a tons per day basis. Please report amount on a moisture basis (e.g., air-dry tons, bone-dry tons, or actual percent moisture).**

d) **The capacity for pulp production, estimated on a tons per day basis. In addition, please report actual production figures, where available. Please report capacity and other amounts on a moisture basis (e.g., air-dry tons, bone-dry tons, or actual percent moisture). Please include information on the capacity for inputs to the processes.**

e) **For each month in operation, any and all information on the PCB content of the materials used in pulp production processes.**

f) **For each month in operation, any and all information on the type and amount of chemicals (e.g., bleaching agents, caustic, solvents, detergents, etc.) used in the pulp production process, if any.**

g) **For each month in operation, please provide the relative percentage for each type of stock used in the pulp production process.**

As stated in the response to Question No. 6, we found no evidence of pulp production processes other than de-inking and/or recycling. However, it should be noted that the Mill used a substantial portion of external virgin pulp (30-100% of stock) in its paper production process **(Table 6; Gren, pp. 35-36, 1997; KS01400002; Lawton, p. 18, 1997; S21002; S21042; S21251; MDNR005322; S16147).**

Question No. 12: Water Sources

Please list the type and amount of all water sources used in the pulp production processes (other than recycling or de-inking). For each of the sources listed, please provide the following information (and reference any and all records, water bills, or other documents that indicate):

a) **For each month in operation, the average amount of water used in the pulp production processes on a million gallons per day basis.**

b) **Identify what type of treatment, if any, was used to treat the raw process water.**

c) **For each month in operation, any and all information on the PCB content of the water used in pulp production processes.**

As stated in the response to Question No. 6, we found no evidence of pulp production processes other than de-inking and/or recycling. However, it should be noted that the Mill used a substantial portion of external virgin pulp (30-100% of stock) in its paper production process **(Table 6; Gren, pp. 35-36, 1997; KS01400002; Lawton, p. 18, 1997; S21002; S21042; S21251; MDNR005322; S16147).**

Pulp Production Outputs: De-inking Processes

Question No. 13: Pulp Production and Fate

Please list the amount of all pulp produced in the de-inking processes. For each process, please provide the following information (and reference any and all records or information that indicate):

a) For each month in operation, the average amount of the pulp produced from the de-inking process on a tons per day basis. Please report amount on a moisture basis (e.g., air-dry tons, bone-dry tons, or actual percent moisture).

The limited information found was reported without any indication of moisture content. In 1950, the average de-inking rate varied from as low as 300 tons/month to an average of 900 tons/month according to the Water Resources Commission (S24500 and 24498). A value of 50 t/d was reported for 1960, and a value of 60 t/d was reported for 1961-1963 (KG01600058). **Based on the diverse nature of the wastepaper furnish, and taking into consideration that internal broke and trim could have been re-pulped in either the recycling or de-inking hydropulper,** these production values likely include some pulp produced from unprinted, as well as printed, paper stock.

b) For each month in operation, the fate of the pulp produced from the de-inking process (i.e., amount used in paper production, amount re-sold, to whom re-sold, etc.).

We found no evidence that pulp produced from the de-inking process was sold. Therefore, it is assumed that all of the pulp produced was used for paper production at the Mill.

c) For each month in operation, any and all information on the PCB content of the pulp produced from the de-inking processes, including any information on the proportion of PCBs partitioning to pulp versus wastewater.

We found no information on the PCB content of pulp produced in the de-inking processes.

Question No. 14: Wastewater Production and Discharge

Please list the amount of all wastewater produced from the de-inking processes. For each process, please provide the following information (and reference any and all records or documents that indicate):

a) For each month in operation, the average amount of wastewater produced from the de-inking processes on a million gallons per day basis.

We found no information about the amount of wastewater produced specifically from the de-inking process for the period 1954 to 1963. The limited wastewater production data available for the period during which de-inking occurred is related to the entire paper production process and can be found in the response to Question No. 26 (a).

b) For each month in operation, the fate of the wastewater produced from the de-inking process (e.g., on-site wastewater treatment, discharge to Publicly Owned Treatment Works [POTW], direct discharge to river, etc.).

In July of 1954, a 55-foot diameter Dorr clarifier was brought online for primary treatment of wastewater from the de-inking and paper production processes. After treatment via the primary clarifier, the treated wastewater was discharged to the Kalamazoo River (S24577, S24498, KB50402843).

Wastewater continued to be treated in this manner until de-inking operations ceased completely in January of 1963 (S24577). No documents have been found that contain information indicating wastewater from the de-inking process was ever discharged to a POTW. Note that sanitary wastewater from the Mill was discharged to the local POTW (S14989). A more detailed description of the wastewater treatment processes can be found in the response to Question 26 (d) and 28 (a).

c) For each month in operation, the amount, measured or estimated, of raw water used in the de-inking processes that was not discharged with process wastewater (e.g., the amount of non-contact cooling water discharged).

We found no information on the raw water used in the de-inking processes that was not discharged with process water.

d) Describe the wastewater stream(s) from creation in the de-inking processes to final discharge point, including material changes thereto.

We found no information about the water sources used specifically in the de-inking process (i.e., the average amount of water used, the type of treatment used for the raw process water, or the PCB content of the water used in this process). The Mill used ground well water as process water for the entire paper making process. Information concerning this process water can be found in the answer to Question No. 24. **It appears that the source of some water used in the de-inking process was recycled white water from the paper machines. However, no detailed information (amount, etc.) is available for this recycled water (Gren, p. 53, 1997).**

e) For each month in operation, any and all information on the PCB, biochemical oxygen demand (BOD), total suspended solids (TSS), total dissolved solids (TDS) and total volatile solids (TVS) content of the wastewater produced from the de-inking processes.

We found no information about the PCB, BOD, TSS, TDS, and TVS content of the wastewater produced specifically from the de-inking process. The limited amount of data available for the period during which de-inking occurred is related to the combined wastewater stream and can be found in the response to Question No. 28 (d).

Question No. 15: Sludge Production and Disposal

Please list the amount of all sludge produced in the de-inking processes (separate from any sludge produced during other production/wastewater treatment operations). For each process, please provide the following information (and reference any and all records or documents that indicate):

a) For each month in operation, the average amount of sludge produced from the de-inking processes and the percent moisture of the material as disposed.

NCASI documents include demonstration plant information on the waste streams from the de-inking system's Lancaster washer and inclined screens. NCASI Technical Bulletins 58 (0064341-0064360) and 63 (0064474-0064480) present average figures for sludge generation and moisture content for sludge generated at the Mill in 1950-1951. Primary sludge averaged 1.5% (by volume) of the wastewater flow and had a solids content of approximately 10% (0064487). The solids content of dewatered lagooned sludge before placement in the landfill may have been 20 to 45% solids from lagooned primary treated sludge (0064341-0064360) with a design number of 30 to 40% solids and sludge generation rates from de-inking of 18 CY/day/ton of wastepaper de-inked (0064474-0064480).

b) For each month in operation, the fate of the sludge produced from the de-inking process (e.g., discharge to lagoon or impoundment, etc.).

We found no information concerning the fate of the sludge produced specifically from the de-inking process. Information concerning the fate of the sludge produced from the wastewater treatment system can be found in the response to Question No. 28 (d)(v).

c) Any and all information on the PCB content and moisture content of the sludge produced from the de-inking processes.

We found no information concerning the PCB and moisture content of the sludge produced specifically from the de-inking process. Information concerning the PCB and moisture content of the sludge produced from the wastewater treatment system can be found in the response to Question No. 28 (d)(iv) and (vi).

d) Describe the lifecycle of the sludge stream from creation in the de-inking processes to final disposal sites.

Starting in 1954, all the wastewater generated from the de-inking process was treated through the primary clarifier prior to discharge to the Kalamazoo River (S07279; S24577; S24498). The primary clarifier removed fibers and other solids in the wastewater, creating sludge that accumulated in the clarifier as part of the wastewater treatment process (S07279). The sludge generated was comprised of ink, clay, fines, and foreign materials washed from the fiber. The accumulated sludge was pumped from the primary clarifier into the dewatering lagoons (S07279; S22257). Periodically, the sludge that had collected in the dewatering lagoons was allowed to dry, removed, and transported off-site for disposal (S22257; KB50402844).

All sludge produced, and subsequently removed from the dewatering lagoons during the period of time that de-inking occurred, was disposed of at the 12th Street Landfill (S26480, S22384). A more detailed summary of sludge disposal practices can be found in the response to Question Nos. 28 (d)(v) and 29.

e) If sludge was disposed at an off-site location, please identify the sites of disposal, the volumes disposed, the dates of disposal, the manner of transportation, etc.

All sludge produced from 1954 until de-inking operations ceased completely in January of 1963 was disposed of at the 12th Street Landfill (S26480; S22384). A more detailed summary of sludge disposal practices, including volumes disposed, dates of disposal, and the manner of transportation, can be found in the response to Question No. 28 (d)(iv).

Pulp Production Outputs: Recycling Processes

Question No. 16: Pulp Production and Fate

Please list the amount of all pulp produced in the recycling processes (other than de-inking), past and present. For each process, please provide the following information (and reference any and all records or documents that indicate):

a) For each month in operation, the average amount of the pulp produced from the recycling process on a tons per day basis. Please report amount on a moisture basis (e.g., air-dry tons, bone-dry tons, or actual percent moisture).

b) For each month in operation, the fate of the pulp produced from the recycling process (i.e., amount used in paper production, amount re-sold, to whom re-sold, etc.).

c) For each month in operation, any and all information on the PCB content of the pulp produced from the recycling process, including any information on the proportion of PCBs partitioning to pulp versus wastewater.

We found no information on the amount of pulp produced **at the Mill** in the recycling process (other than de-inking).

Question No. 17: Wastewater Production and Discharge

Please list the amount of all wastewater produced from the recycling processes (other than de-inking), past and present. For each process, please provide the following information (and reference any and all records or documents that indicate):

a) For each month in operation, the average amount of wastewater produced from the recycling processes on a million gallons per day basis.

b) For each month in operation, the fate of the wastewater produced from the recycling process (e.g., on-site wastewater treatment, discharge to POTW, direct discharge to river, etc.).

c) For each month in operation, the amount, measured or estimated, of raw water used in the recycling processes that was not discharged with process wastewater (e.g., the amount of non-contact cooling water discharged).

d) Describe the wastewater stream(s) from creation in the recycling process to final discharge, including material changes thereto.

e) For each month in operation, any and all information on the PCB, BOD, TSS, TDS and TVS content of the wastewater produced from the recycling processes.

We found no information on wastewater production and discharge associated with pulp production from recycling processes (other than de-inking). Any wastewater production and discharge data related to pulp production from recycling process (other than de-inking) would be reflected in the wastewater production information for the paper production processes and can be found in the response to Question No. 26.

Question No. 18: Sludge Production and Disposal

Please list the amount of all sludge produced in the recycling processes (other than de-inking, and separate from any sludge produced during other production/wastewater treatment operations). For each process, please provide the following information (and reference any and all records or documents that indicate):

- a) **For each month in operation, the average amount of sludge produced from the recycling processes and the percent moisture of the material as disposed..**
- b) **For each month in operation, the fate of the sludge produced from the recycling process (e.g., discharge to lagoon or impoundment, etc.).**
- c) **Any and all information on the PCB content and moisture content of the sludge produced from the recycling processes.**
- d) **Describe the lifecycle of the sludge stream from creation in the recycling processes to final disposal sites.**
- e) **If sludge was disposed at an off-site location, please identify the sites of disposal, the volumes disposed, the dates of disposal, the manner of transportation, etc.**

We found no information on sludge production and disposal associated with pulp production from recycling processes (other than de-inking). Any sludge production and disposal data related to pulp production from the recycling process would be reflected in the sludge production information for the paper production processes and can be found in the response to Question Nos. 28 (d)(iv), (v), (vi), and 29.

Pulp Production Outputs: Other Pulp Production Processes

Question No. 19: Pulp Production and Fate

Please list the amount of all pulp produced in the pulp production processes (other than recycling or de-inking), past and present. For each process, please provide the following information (and reference any and all records or documents that indicate):

- a) **For each month in operation, the average amount of the pulp produced from the pulp production process on a tons per day basis. Please report amount on a moisture basis (e.g., air-dry tons, bone-dry tons, or actual percent moisture).**

b) **For each month in operation, the fate of the pulp produced from the pulp production process (i.e., amount used in paper production, amount re-sold, to whom re-sold, etc.).**

c) **For each month in operation, any and all information on the PCB content of the pulp produced from the pulp production process, including any information on the proportion of PCBs partitioning to pulp versus wastewater.**

We found no evidence of any pulp production at the Mill other than the de-inking and recycling processes mentioned in response to Question Nos. 4 and 5. However, it should be noted that the Mill used a substantial portion of external virgin pulp (30-100% of stock) in its paper production process **(Table 6; Gren, pp. 35-36, 1997; KS01400002; Lawton, p. 18, 1997; S21002; S21042; S21251; MDNR005322; S16147).**

<u>Question No. 20: Wastewater Production and Discharge</u>

Please list the amount of all wastewater produced from the pulp production processes (other than de-inking and recycling), past and present. For each process, please provide the following information (and reference any and all records or documents that indicate):

a) **For each month in operation, the average amount of wastewater produced from the pulp production processes on a million gallons per day basis.**

b) **For each month in operation, the fate of the wastewater produced from the pulp production process (e.g., on-site wastewater treatment, discharge to POTW, direct discharge to river, etc.).**

c) **For each month in operation, the amount, measured or estimated, of raw water used in the pulp production processes that was not discharged with process wastewater (e.g., the amount of non-contact cooling water discharged).**

d) **Describe the wastewater stream(s) from creation in the pulp production process to final discharge, including material changes thereto.**

e) **For each month in operation, any and all information on the PCB, BOD, TSS, TDS and TVS content of the wastewater produced from the pulp production processes.**

We found no evidence of any pulp production at the Mill other than the de-inking and recycling processes mentioned in response to Question Nos. 4 and 5. However, it should be noted that the Mill used a substantial portion of external virgin pulp (30-100% of stock) in its paper production process **(Table 6; Gren, pp. 35-36, 1997; KS01400002; Lawton, p. 18, 1997; S21002; S21042; S21251; MDNR005322; S16147).**

Question No. 21: Sludge Production and Disposal

Please list the amount of all sludge produced in the pulp production processes (other than de-inking or recycling, and separate from any sludge produced during other production/wastewater treatment operations). For each process, please provide the following information (and reference any and all records or documents that indicate):

a) For each month in operation, the average amount of sludge produced from the pulp production processes and the percent moisture of the material as disposed.

b) For each month in operation, the fate of the sludge produced from the pulp production process (e.g., discharge to lagoon or impoundment, etc.).

c) Any and all information on the PCB content and moisture content of the sludge produced from the pulp production processes.

d) Describe the lifecycle of the sludge stream from creation in the pulp production processes to final disposal sites.

e) If sludge was disposed at an off-site location, please identify the sites of disposal, the volumes disposed, the dates of disposal, the manner of transportation, etc.

We found no evidence of any pulp production at the Mill other than the de-inking and recycling processes mentioned in response to Questions No. 4 and 5. However, it should be noted that the Mill used a substantial portion of external virgin pulp (30-100% of stock) in its paper production process **(Table 6; Gren, pp. 35-36, 1997; KS01400002; Lawton, p. 18, 1997; S21002; S21042; S21251; MDNR005322; S16147).**

III. Questions Concerning Paper Production

Processes Description

Question No. 22: Paper Production Processes Description

Please identify and describe any and all paper production operations that occurred on your property, including:

a) The nature of the processes.

The stock sources for paper production included virgin pulp and pulp derived from de-inking (which completely ceased at the Mill in January of 1963) and/or recycling. All of the virgin pulp, which consisted primarily of bleached kraft and sulfite, was purchased from outside sources (S14791; S14983; S20052; S20055; S21376). De-inked pulp and recycled pulp were **predominantly** generated internally at the Mill , **though small amounts were also** purchased from outside sources **(Table 4; Burd, p. 26, 1997; Honeysett, pp. 18-19, 1997).**

At the Mill, wastepaper (books, magazines, office materials, and unprinted paper materials) was used to generate de-inked and recycled pulp. **During the period of de-inking, 40-60 percent of the furnish was de-inked stock (Table 3). At least 90 percent of the de-ink stock consisted of #1 heavy book and magazine wastepaper (nearly all of which was magazine). Up to 10 percent of the remaining wastepaper furnish was made up of ledger paper that was used to "sweeten" the stock (Kauffman Affidavit). While we found no records that provided specific amounts of external unprinted wastepaper that was recycled (not de-inked), Table 5 indicates the amount of broke and trim generated. From reviewing this information, and the pulp and paper stock data in Table 3, it appears that recycling internal broke and trim provided approximately 5 to 20% of the fiber furnish to the papermaking process.**

Available records indicate that the types of wastepaper stock used during the period of de-inking were as follows:

- **1950-1951: "Old papers, essentially magazines" were used to make internally generated de-inked pulp (0064488).**
- **1953-1956: Books, magazines, and office materials were used in the de-inking process (Gren, pp. 11-12) and internal broke and trim (i.e., "shavings off the rewinder") were recycled (Gren, p.20).**
- **1957: Magazines and sheet paper (i.e., "multi-form forms, bond paper, multiple collated, continuous feed" paper) were used in the de-inking process. Papers were classified as colored manifold, white manifold bond, or magazines (Burd, pp. 7-9).**
- **1958: Only magazines were used in de-inking operations (Honeysett, p. 7).**
- **1962: The average loading on Machine No. 4 was roughly 10 percent long fiber kraft to 90 percent de-ink magazine (S19585).**

During the period of de-inking, the remainder of the stock used by the Mill consisted primarily of virgin pulp (30-60 percent) (see Table 6), wet lap (virgin pulp purchased from a Detroit sulfite pulp mill), and recycled (not de-inked) wastepaper consisting of envelope clippings and internally generated broke (Kauffman Affidavit).

During the last quarter of 1962, the de-inking process was phased out. As a result, inventories of wastepaper used as input to the de-inking process decreased dramatically and the amount of purchased pulp used increased accordingly (S00983). By January of 1963, the amount of internally generated, de-inked pulp used for paper production was reduced to zero. In contrast, during this same time period, the amount of paper produced remained constant and the amount of purchased pulp used for paper production nearly doubled (061355-061366; S00983; S06464). After January of 1963, de-inked pulp was no longer generated at the Mill (S00983; S19667; S19692-S19694). **It appears that de-inking was discontinued at the Mill for a number of financial and business reasons. Weyerhaeuser acquired Hamilton Paper Company in 1961 (S00053; S00957; BBL, p.3-27, 1992) so the Mill could serve as an outlet for the virgin pulp Weyerhaeuser produced at its other papermaking facilities (Carl Gren, p. 73, 1997; Kauffman Affidavit). In addition, the Mill realized that discontinuing deinking would help**

to reduce solids and BOD loadings to the wastewater treatment system and the Kalamazoo River (S22090-S22091).

After de-inking ceased, the furnish consisted primarily of purchased virgin pulp. For several years (i.e., 1968, 1973, 1975, 1976, 1978) surveys describe the sole or primary fiber source used by the Mill as purchased virgin pulp or sulfate and sulfite pulp (S21002, S21042, S21251, MDNR005322, S16147, KS01400002).

In addition to virgin pulp, other sources of fiber were used in limited amounts. Internal broke and trim continued to be a source of fiber. In addition, the Mill purchased small amounts of unprinted wastepaper such as envelope clippings, paper plate cuttings, tab cards, broke (bleached kraft and Eastex side rolls), and small amounts of de-ink stock (064717; Burd, p. 26, 1997; Gren, pp. 35-36,73, 76, 1997; Honeysett, pp. 18-19, 1997; Kauffman Affidavit). The available records are as follows:

- **1970 (approximately): On one machine, the stock used was nearly 100 percent virgin fiber. The other machine also used internal and some purchased writing/ledger broke (Honeysett, p. 14-15).**
- **Mid-1970s: Secondary sources of fiber include roll stock, bleach board, SBS, sulfide bleach board (broke from other mills) (Burd, pp. 29-33). Honeysett describes broke purchased during this period as from Federal Board and Perry Cobley, and as East Texas side-run rolls (Honeysett, p. 18, 1997).**
- **1974: Softwood of "milk carton" grade (S20682)**
- **1976: Bleached kraft, sulfate and sulfite pulp, secondary and recycled fibers, tab cards, returned (internal) broke, plate cup stock and de-inked pulp (S19918, S21042, S21376, S19918, S19832, S21376, Gren, p.76-77, Honeysett, p. 18). Wastepaper was not used on a continuous basis (S19918).**
- **1977: Bleached board of "C Grade" (S14210)**
- **1978: Bleached board side rolls of "Kraft" grade, "Blash" dried broke from Westvaco, and uncoated bleach board of "C Grade" were also purchased (S21251, S21522, S21526, S21528)**
- **1980: All virgin pulp (Lawton, p.18)**

After de-inking was eliminated, there were other notable changes that occurred within the paper production operation. Between 1963 and 1965, **new** save-alls were added to all three paper machines, **replacing older save-alls that had been in place since at least 1950 (064069; Kauffman Affidavit; S24499).** Save-alls separate fibers from the process wastewater (MDNR000210; S19725; S19916; S21375; S24653; S24658). The concentrated filtrate from the save-alls (i.e., the process stream that contained the concentrated fibers, commonly referred to as cloudy water) was introduced back into the process and, thus, this can be considered another method of recycling. The clear filtrate from the save-alls (commonly referred to as clear water) was also recycled when possible. By February of 1965, the Mill's facilities had been modified to once again include coated paper production facilities. This modification greatly extended the range of paper grades produced by the Mill. From the available information, it appears that, in the mid-to-late 1970s, there was an increased effort to purchase stock (unprinted paper material) for the recycling process (Burd, pp. 31, 53, 1997; Honeysett, pp. 14, 18, 1997; S14210; S14323; S19832; S19916-S19939; S21376; S21521-S21522; S21526; S21528).

In addition to operating de-inking and recycling processes, the Mill operated a wastewater treatment plant as a part of the paper production process. Waste treatment processes began in 1954 with the installation of a primary clarifier (S24577). Beginning in 1955, sludge generated by the clarifier was pumped to dewatering lagoons, held there, and then transported to the 12th Street Landfill for disposal. From August to September of 1959, an aeration pond pilot plant was operated by the Kalamazoo River Improvement Company and the Mill (S22086). From June 1965 until at least November 1965, an aeration pond pilot plant with a secondary settling tank was operated by the Mill (S22086). To further improve wastewater treatment efficiency, a secondary clarifier with an aerated stabilization pond was added to the system in 1967 (S24577). These improvements were recognized as being innovative and state-of-the-art by both industry and the Michigan WRC (MWRC) (S00290; S24649).

In August 1981, again to improve efficiency, a sludge dewatering plant was completed and began operating; the dewatering lagoons and the 12th Street Landfill were no longer used (BBL, p. 3-30, 1992; Lawton, p. 37, 1997; S00003). This dewatering plant was in operation until the Mill closed in November of 2000.

In addition, in February of 1984, again to improve efficiency, a new wastewater treatment plant began operations (S20133). The design included the abandonment of the previous aerated stabilization pond and construction of a two stage aeration tank system. Nutrients were supplied to both tanks in the form of ammonia and phosphoric acid. A new 95-foot diameter, 12-foot deep clarifier was installed to replace the previously existing secondary clarifier. The wastewater treatment plant continued to operate until the Mill closed in November of 2000.

b) The physical operations that constituted those processes (including without limitation specific types of paper production machines, e.g. cylinder, fourdrinier, etc.).

Separate hydropulpers were used to both mix and slurry either virgin pulp or pulp derived from de-inking and recycling processes. This system included a 14' diameter hydropulper (virgin pulp, stock for recycling) and a 16' diameter hydropulper (stock for de-inking) (S24709). The different pulps flowed to separate storage chests before being combined in the thirteen blending chests (Burd, p. 12, 1997; S13743; S14983). Here, blended pulp was combined with other raw materials such as dyes, clay, fillers and sizing agents. The pulp then flowed to a beater chest and then into a refiner, which would mechanically alter the fibers to give the paper its desired properties and strength. The blended and refined pulp then flowed to a machine chest on one of three Fourdrinier paper machines. The pulp then flowed to the headbox and then onto an endless, fine screen, which retained the fiber layer while allowing water to drain through. The paper mat was then transferred through presses, dryers, and calendar stacks to remove excess water and impart a smooth finish to the paper. Various coatings and brighteners were then applied before the paper was trimmed and packaged for shipment or storage (S14983). The No. 4 machine had a trailing blade coater for coating the paper on both sides. The No. 2 machine had a 98" trim width, while the No. 3 and No. 4 machines had a 118" trim width (S19844; S20052; S20130).

New save-alls, installed on each machine between 1963 and 1965, separated solids from the process wastewater (white water). The solids were introduced back into the machine chests. The white water from the save-alls was stored in the white chests (S13743). Then, depending on the grade of paper being produced, the white water either was recycled back to the regulators and blending chests or was discharged to the wastewater treatment system (as was excess water) (S14984).

c) The dates of such operations.

All three paper machines (No. 2, No. 3, and No. 4) were in operation prior to 1954 through 1985 (exceptions are noted in part (d) below) (S21375). De-inking operations occurred prior to 1954 until January 1963 (S00003; S19692-S19694). The three paper machines and a coating unit were typically operated 5 to 7 days a week, 24 hours a day (S14983; S21002; S21251; KS01400001).

d) The nature and dates of significant changes to those operations.

<u>1954 to 1985</u>

1955: The No. 2 paper machine was rebuilt and production increased to 100 t/d (S08203).

1956: A size press and new dryer section were added to the No. 3 paper machine (S20123).

1957: The calcium hypochlorite bleaching system was started up (S20123).

The No. 3 paper machine was rebuilt (S19885).

1958: A size press and new dryer section were added to No. 2 paper machine (S20123).

1959: Unspecified "further refinements in equipment and processes" increased capacity to 115 t/d (S20123).

1960s: The No. 3 paper machine was rebuilt and production increased to 130 t/d (S08204).

1963: (January) The de-inking of wastepaper was discontinued (MDNR000210; S00041; S19667; S19692; S24577).

Following cessation of de-inking operations, the 16' diameter hydropulper that was used for the de-inking process was rebuilt and subsequently used for preparing virgin and recycled pulp (Gren, pp 64, 1997).

(July-August) Impco Save-Alls were added to the No. 3 and No. 4 paper machines and the roller screens were replaced (MDNR000210; S19916; S21375).

1964:	No. 3 and No. 4 blend chests were added to the stock preparation system (S19885).
1965:	The No. 4 paper machine was rebuilt and production speed increased to 1,000 FPM, up from 600-700 FPM (S19885; S19917; S20144).
	A machine coater (trailing blade) was added to the No. 4 machine (S19667; S19885; S19917; S20143; S24577).
	A Dorr-Oliver, disc save-all (used) was installed on machine No. 2 (S19725; S24653; S24658).
Late 1960s:	At the end of the 1960s, average production was approximately 170 t/d (S08204).
1970:	(August-December) The Mill was closed because of the strike (S20125; S20139);
	(December) The No. 4 paper machine was started up again (S15125; S15152).
1970 – part of 1971:	Paper machine No. 3 was down (S19885).
1971:	(March) The No. 3 paper machine was started up again (S15125; S15152).
1972:	(October) The No. 2 paper machine was started up again (S15125; S15152; S18690).
1975:	(January) The No. 2 paper machine shut down (S19885; S19917; S19997; S20063; S21375).
1977:	(July) The No. 2 paper machine was rebuilt (S19885; S19917) and production increased to 200 t/d (S08204).
	A stock preparation system was added to No. 2 paper machine (S19917).
1980:	The No. 4 paper machine began to be rebuilt (Lawton, p. 58, 1997; S20123).

Inputs: Paper Production Processes

Question No. 23: Stock Sources

Including without limitation input from the pulp production processes described above, please list the type and amount of all stock (e.g., virgin fiber/pulp; de-inked pulp; secondary pulp, etc.) from internal and external sources used in the paper production processes, past and present, and the source for each type of stock. For each paper production process and type of stock listed, please provide the following information (and reference any and all records or documents that indicate):

The types of stock used in the paper production processes are limited to virgin pulp (external), de-inked pulp (internal and external), and recycled pulp (internal and external). More specific information concerning the various grades of these general types can be found in Table 4.

a) For each month in operation, the source(s) (internal and external) of the stock used in the paper production processes.

Prior to 1963, the primary raw materials used for paper production were Weyerhaeuser pulp and "other" pulp, both purchased from external sources, and internally generated de-inked and recycled pulp (061355-061366). Following the cessation of de-inking operations in January of 1963, the primary raw materials used in paper production were purchased bleached kraft and sulfite pulps (virgin). In addition, small amounts of de-inked and recycled pulp were purchased periodically (Burd, pp. 29-30, 1997; Honeysett, pp. 18-19, 1997; Responses to 4th Interrogatories, p. 3, 1997). Some recycled pulp was also generated internally.

A list of available paper stock (i.e., pulp) and their sources (if available) is presented in Table 4.

b) Whether stock was sorted before use in the paper production processes and, if so, by what method.

As described earlier, wastepaper was hand sorted prior to its use as stock for de-ink pulp production. Bales of wastepaper were unbaled onto a conveyor belt and hand sorted, removing non-pulpable and non-bleachable items such as metals, plastics, and latex-containing materials (Burd, pp. 6-7, 1997; Gren, p. 14, 1997). **Wastepaper that was removed, including NCR to the extent that any post-consumer NCR forms contained in the wastepaper furnish, was re-baled and sold back to wastepaper suppliers (Kauffman Affidavit).** The relative amount of virgin pulp and de-inked or recycled pulp that was used varied depending on the grade of paper being produced (Gren, p. 20, 1997; Burd, p.20-21, 1997).

c) For each month in operation, the average amount of each material used in the paper production processes on a tons per day basis. Please report amount on a moisture basis (e.g., air-dry tons, bone-dry tons, or actual percent moisture).

Data on pulp usage is available from the financial statements (the term "wood pulp" is used in these documents) of the Mill for the years 1957 to 1963. Data on paper stock usage is available from the same financial statements, from 1954 through 1962. This information is presented in Table 3 (reported only as "t/d," without any indication of moisture content). In the last quarter of 1962, there was an increase in the pulp used and a decrease in the paper stock used; this change is indicative of the reduction in de-inking prior to its complete cessation in January of 1963 (Table 3).

In addition, the following information was found:

- An average of approximately 155.0 t/d of wood pulp was reportedly used in 1971 (S14994).
- An average of approximately 64.7 t/d of wood pulp (bleached kraft and sulfite) was reportedly used in 1976 (Undated EPA Survey, S21376).

d) **The capacity for paper production, estimate on a tons per day basis. In addition, please report actual production figures, where available. Please report capacity and other amounts on a moisture basis (e.g., air-dry tons, bone-dry tons, or actual percent moisture). Please include information on the capacity for inputs to the processes.**

Information is reported only as "t/d," without any indication of moisture content:

<u>1954 to 1985</u>

- In the late 1950s, capacity of the paper machines was estimated at 150 to 300 feet per minute (FPM) **(Honeysett, p. 23, 1997).**
- In 1959, "further refinements in equipment and processes" increased capacity to 115 t/d (S20123).
- In 1968, the total capacity of the three paper machines was "150 tons" (S24666). Although not specified in the underlying document, it is reasonable to assume that this capacity is on a "per day" basis.
- Between July 1974 and June 1975, maximum capacity at the Mill was reported as 200 t/d. The average amount of paper actually produced was 177 t/d. (EPA Mill Report, 1975; S20051).
- In 1976, paper production capacity at the Mill was 200 t/d (S19838). In that year, average paper production was under capacity at 150 t/d (S19842): the No. 3 machine was producing 53 t/d (800 feet per minute; FPM) release paper and the No. 4 machine was producing 97 t/d (1100 FPM) book paper. The No. 2 machine, with a capacity of 50 t/d (S20052), was not in operation at the time (S19844)
- Actual production figures for years 1955 through 1985 are presented in Table 5.

e) **For each month in operation, any and all information on the PCB content of the materials used in paper production processes.**

We found the following information regarding the PCB content of the materials used in the paper production process.

<u>1954 to 1985</u>

- No information is available prior to 1974.
- A handwritten document, dated 1974, listed the amount of PCBs present in raw materials such as dyes and pulps based on information reported by suppliers and the amount of product purchased by the Mill (Gren, pp. 115-118, 1997). A letter dated January, 1976, corrected some of the information contained in the handwritten document (KJ00800090). Below is the accurate information:

- The pulps Pinnacle Prime Softwood, Pinnacle Prime Hardwood, and New Berm Bleached Softwood each contained 0.5 ppm PCBs. The January, 1976, letter stated that New Berm Bleached Softwood was no longer being used (KJ00800090).
- The pulps Domtar Q-70 and Domtar Q-90 each contained 1 ppm PCBs.
- The dye Leucopher 7002 contained 0.03 ppm PCBs (S20614).
- Collectively, the amount of PCBs contained in these materials totaled a maximum of approximately 22 lbs. for 1974 (Gren, pp. 115-116, 1997; S20614).

- In 1972 and 1977-1978, the Mill submitted requests to its suppliers for information on "critical materials", including PCBs, that may have been present in products supplied to the Mill. This request was made to meet the Mill's obligation to the Michigan Department of Natural Resources (MDNR) under Act 200 P.A. 1970 and Act 293, P.A 1972. These requests yielded the following information:
  - PCBs were reported to be present in "trace" amounts for the following wood pulp grades: Cosmopolis Export, Tyee Sawdust, Regular, and Kamloops (S14255).
  - The materials Dow Latex 620 and Dow Experimental Latex XD-7820.02 contained less than 0.05 ppm PCB (S14227).
  - The materials Gum 260 and Penford Gum 290 contained less than 0.5 ppm PCB (S14321; S17877-S17881).
  - The material Nopcote C-104 contained less than 0.2 ppm PCB (S14353).
  - 86 suppliers responding to the Mill's request for "critical materials" information did not identify their supplied materials as containing PCBs (S14318, S14210, S17804, S17834, S17846, S17859, S17860, S17865, S17873; S14187-S14188; S14211-S14216 ; S14217; S14221-S14227; S14229 ; S14231; S14232 -S14234 ; S14206-S14209; S14260; S14262 -S14275; S14276-S14278; S14279; S14281- S14284; S14285-S14286; S14292; S14294; S14299; S14301; S14303; S14305; S14307; S14309-S14310; S14312 -S14316 ; S14318; S14319; S14325; S14335; S14337; S14339-S14341; S14343; S14345; S14348; S14350; S14351; S14355-S14379; S14380; S14381- S14383 ; S14384-S14389; S14392 ; S14394-S14395; S14397; S14414-S14418; S17796-S17802; S17804; S17805; S17818- S17819; S17820; S17821- S17825; S17829; S17830; S17831-S17832; S17834; S17844; S17845; S17847 ; S17851; S17852-S17854; S17855; S17856 -S17858; S17859; S17860-S17864; S17865; S17866-S17871; S17874; S17876; S17908-S17909; S17945-S17947; S17949- S17950; S17951-S17952; S17953-S17954; S17955; S17956-S17957; S17965; S20620-S20621; S20663; S21575; S21578).
  - Several suppliers tested and did not find PCBs at detectable levels (S14277; S14353; S17880).

- An undated National Council of the Paper Industry for Air and Stream Improvement Inc. PCB survey states that suppliers conducted "considerable PCB testing" on wastepaper to exclude PCBs from inputs (S19448). However, the survey does not report the results of this testing.
  - One supplier, Brown Company, was identified as "routinely" testing for PCBs on their bleached/de-inked fiber supplied to the Mill (S19289).

f) For each month in operation, any and all information on the amount of additional PCB or PCB-containing materials added to any product during production.

We found no information suggesting that any additional materials containing PCBs were added to any product during production.

g) For each month in operation, the relative percentage for each type of stock used in the paper production process.

Based on the available data found in Table 3, the relative percentages of each type of stock used in the paper production process from 1957 to 1962 were calculated and are presented in Table 6.

Question No. 24: Water Sources

Please list the type and amount of all water sources used in each of the paper production processes, past and present. For each of the sources listed, please provide the following information (and reference any and all records or documents that indicate):

Only groundwater has been identified as a source of water for the all production processes at the Mill, including the paper production process (S22128; S21002; S20019; S19779; S14789). The groundwater is from company-owned, on-site wells. Although there is also a fairly significant municipal water supply to the property, this supply is only used for such things as drinking water, showers, and sanitary purposes, not for the paper production process (S22128; S21002; S20019; S19779; S14789).

a) For each month in operation, the average amount of water used in the processes on a million gallons per day basis.

There is little information available concerning water supplied to the paper production process. Data are available for only five years (1964, 1968, 1971, 1976, and 1978). Review of available information provided no monthly data, only annual averages, concerning the amount of water used in the paper production process. These annual values can be found in Table 7.

b) Identify what type of treatment, if any, was used to treat the raw process water. Please provide the dates thereof.

There is evidence that all, or some portion, of the intake water was chlorinated prior to use within the Mill (S20597; S20606). In addition, some raw process water was treated for corrosion control and water softening purposes (S19779). This information is presented in Table 7.

c) For each month in operation, any and all information on the PCB content of the water used in process.

We found no information regarding the PCB content of the water used in the paper production process.

Outputs: Paper Production Processes

Question No. 25: Final Paper Production and Fate

Please list the type (e.g. parchment, bond, coated papers, boxboard, etc.) and amount of all final paper produced in the paper production processes, past and present. For each type listed, please provide the following information (and reference any and all records or documents that indicate):

1954 to 1985

- Prior to 1964, the Mill was primarily a manufacturer of uncoated, printing (mostly for books) and writing grades of paper (S20128; S20132). Other grades produced included bond, manifold, poster, blanking, table, and cover paper. Some specific types included Michigan, Wolverine, and test brands of Antique Book, Offset, English Finish, and Litho papers.
- From December of 1964 to February of 1965, the Mill's facilities were modified to include coated paper production facilities. This extended the range of printing grades produced by the Mill and initiated the production of technical, specialty papers. Following the equipment upgrades, the Mill began production of coated grades of commercial offset and letter-press printing papers, coated 1-side label paper, and continued to produce the line of uncoated, commercial printing papers already established at the Mill (S20143-S20146).
- Production records for March through May of 1966 indicate that specialty papers, including release backing papers (see Table 5), were produced. Other specialty grades produced included Smoothprint Antique, Rosedale Offset, Test Offset (gray), Eye Ease, Hamilton Book, Rosedale English Finish, Trafalgar English Finish, Duplicator (color), Test English Finish, Printers English Finish, Smoothprint Manifold, and 263 Offset (S24699-S24705).

- In 1967, available information indicates that the Mill produced coated and uncoated fine printing papers manufactured for book publishing and commercial printing, in addition to producing uncoated specialty papers used in labeling and in copying machines (S20142).
- In 1968, products were described, in very general terms, as either coated or uncoated fine papers (see Table 5) (S22126-S22127).
- An undated brochure for Plainwell Paper Company (post-1970) advertised two primary types of paper: technical specialty papers and printing papers (S06874). These types of paper are described as follows:
  - Technical specialty papers included release backing, electrophotographic base, sterilizable, stencil backing, gummable, cigarette filter mouthpiece, and outer wax laminated papers. Electrobase (a.k.a. conductive base, electrophotographic base) papers were used in zinc oxide Electrofax copiers. The Mill's release backing papers were used for wallpaper, shelf lining, tags, and labels. Cigarette filter mouthpiece paper is a type of coated paper. Outer wax laminated papers are coated papers used in detergent boxes that enable gravure-printing on one side and act as a barrier to wax on the other side (S06874). The Mill also manufactured specialty paper capable of withstanding tests of up to 450 °F, coated papers printable in four colors and on both sides, and perforated, folded, and stacked papers (S06874).
  - Printing papers include Kashmir matte (gloss and dull), Michigan matte, Plainwell matte and gloss, and heat resistant label grades (S20137). Kashmir matte, gloss, and dull printing papers are bright white sheets with a slick finish that are used in items such as annual reports and sales brochures. The Michigan matte and the Plainwell gloss, dull, and matte lines are standard grades.
- Fine printing and industrial grade papers were produced in 1971 (S14994). "Industrial grade" paper, a term used in EPA surveys, is a market-based term, and can include a wide range of paper types and grades.
- In 1975, products were described, in very general terms, as being either book or release papers (see Table 5) (S19880-S19881; S20052).
- Release base, conductive base, specialty, and general industrial grade papers were produced in 1973 and 1976 (KS01400002; S19826).

a) For each month in operation, the average amount of the paper produced from the process on a tons per day basis.

The average amount of paper produced, on a monthly basis, is included in Table 5 for those months for which information is available.

b) For each month in operation, the fate of the paper (including wastepaper) produced from the paper production process (i.e., amount re-used, amount sold, to whom sold, etc.).

Information regarding the fate of the paper produced in the paper production process can be found in Table 5. Information was available regarding the amount of finished product that was sold, but not regarding to whom it was sold.

c) For each month in operation, any and all information on the PCB content of the paper produced from the processes, including any information on proportion of PCBs partitioning to paper versus wastewater.

We found no information regarding the PCB content of the paper produced from the paper production process.

<u>Question No. 26: Wastewater Production and Discharge</u>

Please list the amount of all wastewater produced from the paper production processes, past and present. For each process, please provide the following information (and reference any and all records or documents that indicate):

a) For each month in operation, the average amount of wastewater produced from the paper production processes on a million gallons per day basis.

The breakdown for the average monthly amount of wastewater produced through each individual process (i.e., de-inking, recycling, and paper production) is unknown. The amount of wastewater produced from all the paper production processes (i.e., de-inking, recycling, and paper production) has been estimated based on the measured flow rate data for the discharge from Outfall 005 and the flow rate data through 1966 for the discharge from Outfall 002 (Sewer No. 2) (Table 2). Outfall 005 served as the discharge point for the process wastewater generated at the Mill. Up until 1966, a portion of the wastewater generated from the paper-making processes **(overflow from the white water tank on the Paper Machine No. 2, and** exclusive of the de-inking wastewater) was discharged through Outfall 002 (Sewer No. 2). The monthly, average discharge flow rate data for Outfall 005 are presented in the response to Question No. 28 (d)(i) and in Table 1. Discharge flow rate data for Outfall 002 (Sewer No. 2) is presented in the response to Question No. 30 and Table 2. Note that the average monthly wastewater production data from Outfall 005 reflects wastewater produced from paper production, de-inking, and recycling processes.

b) For each month in operation, the fate of the wastewater produced from the paper production process (e.g., on-site wastewater treatment, discharge to POTW, direct discharge to river, etc.).

We found the following information regarding the fate of the wastewater produced from the paper production process.

- Prior to July of 1954, all wastewater generated from the paper production processes was discharged directly to the Kalamazoo River (S07279; S22086; S24500)
- From July of 1954 to 1966, all of the de-inking wastewater and **all papermaking processing wastes, except waste from the overflow from the white water tank on the Paper Machine No. 2, were treated prior to being discharged to the Kalamazoo River** (064048; **064052; Kauffman Affidavit**). The rest of the wastewater was discharged directly to the Kalamazoo River.
- After 1966, all the wastewater generated from the paper production processes was treated prior to being discharged to the Kalamazoo River.

We found no information indicating wastewater from paper production processes was ever discharged to a POTW. Note that sanitary wastewater from the Mill was discharged to the local POTW (S14989).

c) For each month in operation, the amount, measured or estimated, of raw water used in the paper production processes that was not discharged with process wastewater (e.g., the amount of non-contact cooling water discharged).

We found limited information regarding the raw water used in the paper production process that was not discharged with process wastewater. The available raw water discharge data is related to Outfalls 002, 003, and 004 and can be found in Table 2. It should be noted that, for Outfall 002, volumes listed prior to 1966 may also include some **overflow from the white water tank on the Paper Machine No. 2**, but excludes any de-inking wastewater. For Outfall 004, volumes listed prior to 1973 may include some emergency overflow wastewater.

d) Describe the wastewater stream(s) from creation in the paper production processes to final discharge point, including any material changes thereto.

Wastewater generated from the paper production process begins at the paper machines. Each machine is equipped with a fine screen called a "wire." The screen retains the fiber from the pulp slurry (S14983). The water (wastewater) that passes through the screen is collected in a couch pit and then transferred from the couch pit to the disc type save-all. The save-all further separates the fibers and other solids from the wastewater. A portion of this water is recycled back into the paper making process, while the excess wastewater is transferred to the wastewater treatment plant (S14984).

The following describes the wastewater stream for various periods of the wastewater treatment operations:

- From July of 1954 to **1966 all de-ink and papermaking processing wastes, except waste from the overflow from the white water tank on the Paper Machine No. 2, were treated prior to being discharged to the river** (064048; **064052; Kauffman Affidavit**). The primary clarifier removed solids from the wastewater stream prior to discharge into the Kalamazoo River via Outfall 005. Until sewer modifications were made in 1966, **the overflow from the white water tank on the Paper Machine No. 2** (exclusive of any de-inking wastewater) was discharged directly to the Kalamazoo River through Sewer No. 2 (Outfall 002) (064048; S24568; S24659). The process wastewater that was discharged through Sewer No. 2 likely included clear leg water (i.e., the water that was filtered through the save-alls), which typically had lower TSS and flow values compared to the wastewater discharged through Outfall 005 (S24580; Tables 1 and 2).

- In 1963, after **new** save-alls were installed on the No. 3 and 4 paper machines, we believe that the cloudy water from the save-alls (i.e., the waste stream with the paper fibers) was either recycled or discharged to the wastewater treatment plant, as needed. In 1966, all process wastewater was routed through the wastewater treatment system then discharged through Outfall 005 to the Kalamazoo River (S24577, S24568, and S24659).

- From December of 1967 through early 1983, wastewater from the paper production processes was treated in the primary clarifier, an aeration stabilization pond, and a secondary clarifier (S24577, S24666, S24667, S00043). Treated wastewater was discharged to the Kalamazoo River.

- After February of 1984, all wastewater from the paper production process was treated in the primary clarifier, an activated sludge treatment system (which replaced the aeration stabilization pond), and a new secondary clarifier (S20133, S22764-S22767, S13795-S13797). The new wastewater stream was much the same as prior to 1983; the activated sludge treatment system provided the biological treatment of the wastewater rather than the aeration pond. Treated wastewater was discharged to the Kalamazoo River.

The wastewater stream descriptions above are representative of all wastewater associated with the paper production process at the Mill.

e) **For each month in operation, any and all information on the PCB, BOD, TSS, TDS and TVS content of the wastewater produced from the paper production processes.**

Available information on the PCB, BOD, TSS, TDS, and TVS content of the wastewater produced from the paper production processes, before and after treatment, is presented in Table 1 (Outfall 005) and Table 2 (Outfall 002, prior to 1966).

Question No. 27: Sludge Production and Disposal

Please list the amount of all sludge produced in the paper production processes (separate from any sludge produced during other production/wastewater treatment operations), past and present. For each process, please provide the following information (and reference any and all records or documents that indicate:

a) For each month in operation, the average amount of sludge produced from the paper production processes and the percent moisture of the material as disposed.

b) For each month in operation, the fate of the sludge produced from the paper production process (e.g., discharge to lagoon or impoundment, etc.).

c) Any and all information on the PCB content and moisture content of the sludge produced from the paper production processes.

d) Describe the lifecycle of the sludge stream from creation in the paper production processes to final disposal sites.

e) If sludge was disposed at an off-site location, please identify the sites of disposal, the volumes disposed, the dates of disposal, the manner of transportation, etc.

We found no information on the sludge produced in the paper production process separate from sludge produced during other production/wastewater treatment operations. Information on the sludge produced during the wastewater treatment operations is provided in the response to Question No. 28 (d) and 29.

III. Questions Concerning Wastewater and Sludge Treatment and Disposal

Treatment:

Question No. 28: Wastewater Treatment Facilities

Please identify and describe the wastewater treatment facilities used to treat wastewater streams and discharges, permitted or otherwise, generated at each facility (this includes without limitation both on-site treatment and bypass systems, and POTWs, if used to treat wastewater generated from the facility), including the following:

a) The type, capacity, dimensions, and startup date for each unit process (include process flow diagram(s) and a description of solids removal processes). Please indicate the approximate detention time in settling ponds, and whether any flocculates or other materials were added to aid in solids settlement, etc.

- In July of 1954, a 55-foot diameter, 12-foot side-wall height Dorr clarifier, which has a capacity of 2.56 million gallons per day (mgd) at a corresponding retention time of 2 hours, was placed in operation (S24577; S24498; S00980; S18928-S18930). In 1972, it was documented that the retention time in the clarifier was 3.3 hours at an average flow rate of 1.643 mgd (S18928-S18930).
- Beginning in 1955, sludge was pumped from the wastewater treatment system to a series of sludge drying lagoons west of the Mill (S18928-S18930). The sludge was dried, then removed and transported to the 12th Street Landfill for disposal (S22043).
- From August to September of 1959, an aeration pond pilot plant was operated by the Kalamazoo River Improvement Company and the Mill (S22086).
- From June 1965 until at least November 1965 an aeration pond pilot plant with a secondary settling tank was operated by the Mill (S22086).
- In December of 1967, a secondary treatment system was placed in operation (S24577). The secondary wastewater treatment system included an aerated stabilization pond and a secondary clarifier (S24667).
  - The aerated stabilization pond had top dimensions of 322 feet by 162 feet, bottom dimensions of 268 feet by 128 feet, a depth of 8.75 feet, free board of 1.75 feet, side slope of 1/3, and a bottom slope of 1% (S18929). Several documents issued prior to system construction identified the aeration basin capacity to be 1.85 million gallons (S06864; S24667). However, subsequent documents identified the hydraulic capacity of the aeration basin to be 2.2 million gallons, with a hydraulic retention time of 15.3 hours at a flow rate of 3.5 mgd (S16968). The aeration basin was equipped with two 75 horsepower fixed surface aerators (S18930).
  - The secondary clarifier had a diameter of 55 feet and a side-wall depth of 13 feet, with an average retention time of 3.6 hours at a corresponding average flow rate of 1.643 mgd (S18929; S18930). Until the mechanical sludge dewatering process (described below) was implemented in 1982, sludge from the primary and secondary clarifiers was discharged to the onsite dewatering lagoons and subsequently sent for disposal at the 12th Street Landfill.
- In 1981, a new 100-foot diameter primary clarifier replaced the original primary clarifier built in 1954. Also, a two-meter filter press sludge dewatering machine and a 50,000-gallon sludge holding tank were installed to replace the drying lagoons (S16954). We did not find the capacity of the 100-foot diameter primary clarifier. The wastewater sludge produced following startup of the sludge dewatering process was sent for off-site disposal at commercial landfills (S07280).
- In 1983, final design requirements for the wastewater treatment plant upgrades were determined. The new treatment plant, which was still in operation until the Mill closed in November of 2000, began operations in February of 1984 (S20133). The design was based on a 3.5 mgd flow rate. The design included the abandonment of the previous aerated stabilization pond and construction of a two stage aeration tank system. The first tank, called

the Pre-aeration Tank, was 25 feet wide by 92 feet long and 18 feet deep with a retention time of 2.5 hours at a flow rate of 3.5 mgd. The second tank, called the aeration tank was 50 feet wide by 80 feet long and 18 feet deep. This tank had a hydraulic retention time of 4 hours at a flow rate of 3.5 mgd. Nutrients were added and air was supplied for agitation and bacterial growth. Nutrients were supplied to both tanks in the form of ammonia and phosphoric acid. A new 95-foot diameter, 12-foot deep clarifier was installed to replace the previously existing secondary clarifier. A new meter and sampling system was installed. Outfall 005 was also modified and the discharge pipe was placed along the river bed. A dissolved air flotation thickener was added to the system to take the sludge from the secondary clarifier, which was about 0.5% solids, and thicken it to about 5% solids. A 50,000-gallon aerated secondary sludge storage tank was constructed to hold up to 5 days production of thickened secondary sludge. The pre-existing 50,000-gallon primary sludge storage tank was modified with a new mixer adequate for a more uniform delivery to the belt filter press (S22384-S22388; S22761-S22880; S13795-S13797).

The information does not definitively indicate either what type of, or over what time frame, coagulants and/or polymers (flocculants) were used to enhance solids settling characteristics. Specific information found includes:

- In 1973, several lab trials were run in attempt to improve settling efficiency in the primary clarifier. Trials were conducted with ferric chloride, lime, alum, two separate Hercules polymers, and one Sandoz Corp. polymer in various combinations. It was found that no combination worked every time, though lime seemed to be the most efficient (S16915; S16888-S16889).
- It was noted on June 22, 1980, that the polymer pump for the primary clarifier was repaired on several occasions. However, no information was found to indicate which polymer was being used at the time of the repair (S14571).

The following process flow diagrams are provided as Attachments 2-4 to illustrate the wastewater treatment processes that have been utilized at the Mill.

- A process flow diagram could not be located for the period from 1955 to 1967.
- Attachment 2: A process flow diagram for the time period of 1967 to 1982 (S20042).
- Attachment 3: A process flow diagram for the time period of 1982 to 1984 (S00029).
- Attachment 4: A process flow diagram for the time period of 1984 to present (S00030, S00031, and S00710).

Note that sanitary wastewater from the Mill was discharged to the local POTW (S14989).

b) The outfall(s) where the treated or bypassed wastewater was discharged.

Since the initiation of wastewater treatment in 1954, the treated wastewater has been discharged to the Kalamazoo River through Outfall 005 (KS01400002).

Outfall 005 is also identified as Outfall No. 030049 (KS01400002; S21042). Outfall 004 was used to discharge any emergency overflow (i.e., bypass flow) from the sump pit that collected wastewater for conveyance to the wastewater treatment plant (S24580). Outfall 004 was used for this purpose at least through 1968 (S24580). In 1973, it was reported that Outfall 004 was used for the discharge of non-contact cooling water from the three paper machines and the boiler plant (KS001400002). In addition, the overflow from the white water tank on the Paper Machine No. 2 (but exclusive of any de-inking wastewater) was discharged through Sewer No. 2 (Outfall 002) prior to 1966 (064048). Refer to the response to Question No. 30 for additional information on the outfalls that have existed at the Mill.

From the Mill's 1974 NPDES permit application, it appears that procedures were in place to address the possibility of having to bypass the primary clarifier for repairs or maintenance (S21193). At such times, only one paper machine could be run and wastewater would be bypassed around the primary clarifier and sent to the secondary clarifier. A second, portable pump could be used if necessary to empty sludge from the secondary clarifier to the sludge pits. This procedure avoided the bypass of untreated wastewater to the Kalamazoo River.

c) The NPDES permit number(s) for the outfalls listed in b), above.

NPDES permit number MI0003794 covers the discharges from the outfalls described above (S14983; S14984; S14523).

d) Summary of all operating data for the period of 1954 through the present, including:

Operating data for the wastewater treatment system, specifically flow rate data, influent and effluent TSS, TDS, TVS, BOD, and PCB data, and wastewater sludge generation, disposal, and PCB data, for the period of 1954 through the present were available from multiple sources, including, but not limited to:

- **Monthly Discharge Monitoring Reports (DMRs) submitted to the MDEQ (or its predecessors).**
- **Michigan Water Resources Commission discharge monitoring reports.**
- **Daily bench sheets completed by wastewater treatment system operators.**
- **Internal Mill memos summarizing wastewater treatment activities and data.**

- **Handwritten calculations and notes summarizing wastewater treatment data.**

Each of the data sources was reviewed. In many instances, multiple documents contained the same data but the data were reported in different formats. When multiple sources of data where available for the same period of time, preference was given to reporting the data presented in available monthly DMRs or MWRC discharge monitoring reports, as these sources were considered to be the most reliable. Where monthly averages were available (i.e., from monthly DMRs), daily wastewater data available for the same period were not included in the data summary tables.

Some of the available wastewater-related documents contained information that could not be used because the time period for the data was unknown or the documents consisted of handwritten notes and it was not possible to determine what the data represented with an adequate degree of certainty. In some cases, data for a specific time period was available in both a concentration (parts per million) and a mass discharge rate basis. When both concentration and mass discharge data were available for a certain time period, only the mass discharge data (pounds per day) were included on the appropriate summary table. If no mass discharge data were available, the concentration data were included on the appropriate summary table.

(i) Flow rate data.

Available monthly average flow rate data for Outfall 005 is provided in Table 1. The limited flow rate data for Outfalls 002 and 004 are summarized in Table 2.

(ii) Influent and effluent quality data for TSS, TDS, TVS, BOD, and PCBs (if available).

Available influent and effluent quality data for TSS, TDS, TVS, BOD, and PCBs for Outfall 005 are provided in Table 1. The limited analytical data for Outfalls 002 and 004 are summarized in Table 2.

There are several aspects of note regarding the wastewater data for Outfall 005 that is summarized in Table 1. The data available from the late 1950s and early 1960s clearly indicate that there was a significant decrease in the TSS and biochemical oxygen demand (BOD) discharge rates to the river following the cessation of de-inking operations in 1963. Further reductions in TSS and BOD discharge rates are clearly evident following startup of the initial secondary wastewater treatment system in 1967 and the activated sludge process and other system upgrades in 1984.

Also, it should be noted that the elevated levels of BOD and TSS in the discharge from Outfalls 002 and 003 during 1965 are attributable to the discharge of process water from the preparation of coating materials and from paper coating operations (S22082). The paper coating operations commenced in February 1965 (S22268). As

the coating operations were not a source of PCBs, there would not have been an increase in PCBs associated with the increase in TSS during this time. During 1966, in-plant changes were made to separate the process water from the cooling water and storm water systems (S24658). Thus, after 1966, it is assumed that the process water from the paper coating operations was discharged to the wastewater treatment plant.

(iii) Summary of all known or documented bypasses or spills into the Kalamazoo River or its tributaries.

Information on all known or documented releases to the Kalamazoo River or its tributaries can be found in Table 10 and is briefly discussed in the response to Question No. 31.

(iv) Quantity of sludge generated and removed from the treatment system (specify if the quantity is on a dry or wet weight basis and the percent moisture if available).

The available data on the volume of sludge disposed in the 12th Street Landfill, reported on a yearly basis, is presented in Table 8. Data in Table 8 are from historical Mill documents that do not indicate the methods used to calculate the sludge volume.

There are several aspects of note regarding the sludge volume data listed in Table 8. First, there was a significant decrease in sludge disposal quantities in 1964 and 1965, consistent with the cessation of de-inking operations in January 1963, and the lag time between when the sludge was added to the dewatering lagoons and when it was actually transported to the 12th Street Landfill. Second, sludge quantities increased with the implementation of secondary wastewater treatment processes in 1967. And lastly, sludge disposal quantities were very low in 1970 and 1971 due to the temporary shut-down of the Mill due to a strike in 1970.

We found a limited amount of information regarding the moisture content of the sludge produced from the wastewater treatment process. The following is a summary of the sludge moisture content information.

- An undated document from Quirk, Lawler & Matusky Engineers reported the percent solids of the sludge produced from the secondary treatment facility to be 2% (S24669). This would equate to a moisture content of approximately 98%.
- An undated document from George Lawton reported that the percent solids would increase from 3% to 4% to about 10% while in the dewatering lagoons (S22384). This would equate to a decrease in the approximate moisture content from between 96% and 97% to 90%.
- In October of 1980, a sludge sample collected from an unknown location in the wastewater treatment system reportedly contained 2.70% solids (S18429). This would equate to a moisture content of approximately 97.3%.

- In November of 1984, a dewatered primary sludge sample reportedly contained 40.5% total solids (S00322). This would equate to a moisture content of approximately 59.5%.

(v) **For each month in operation, the amount and fate of the sludge produced from the wastewater treatment process, including without limitation sludge generated on your property and produced to a POTW, and sludge generated at a POTW as a result of the treatment of wastewater discharged to the POTW from (at least in part) your property.**

We found no information indicating sludge generated at the Mill was ever discharged to a POTW. The approximate quantity of sludge produced is available on an annual basis, as determined from the records of periodic sludge lagoon removal activities and sludge dewatering activities. This information is presented in the response to part (iv), above, and in Table 8. Furthermore, the following provides additional information concerns the fate of sludge produced from the wastewater treatment process:

- Sludge production began in July 1954 with the installation of a primary clarifier for wastewater treatment (S07279; S24577). The sludge that accumulated in the primary clarifier was pumped into the dewatering lagoons, allowed to dry, and was periodically removed and transported to the 12th Street Landfill for disposal (S07279; KB50402843-KB50402844; S22384). Historic Mill documents refer to the 12th Street Landfill in various terms, including the disposal area on 12th Street (S07279), an abandoned borrow pit (S24668), and sludge dump (S22384).
- From 1955 to 1981, sludge generated in the wastewater treatment plant was disposed of at the 12th Street Landfill (S07280; S26482). Thus, during the period of de-inking at the Mill (up until January 1963), all wastewater treatment sludge was disposed of at the 12th Street Landfill. Prior to the installation of the mechanical belt press in 1981, the sludge was periodically removed from the dewatering lagoons and the aeration stabilization pond and was trucked to the 12th Street Landfill (S22384-S22385). Although the 12th Street Landfill is located on property owned by the Mill, it is off-site from the Mill property, thus, it is included as an off-site disposal facility under this response.
- In 1967, a secondary wastewater treatment system was installed, it consisted of an aeration stabilization pond and a secondary clarifier (S24577; S22384). Sludge that accumulated in the primary and secondary clarifiers was pumped into the dewatering lagoons, allowed to dry, and periodically removed and transported to the 12th Street Landfill (S22384; S24668; S24669).
- In August of 1981, a sludge dewatering facility was installed. It consisted of a belt filter press and sludge handling and storage facilities (S22384-S22385). Following start-up of the sludge dewatering facility, the sludge dewatering lagoons were no longer utilized and sludge produced from the wastewater treatment plant was sent for off-site disposal at commercial landfills (S07280). Residual sludge remaining in

several of the dewatering lagoons was removed and deposited in the 12th Street Landfill (S07280).

- Following start-up of the sludge dewatering facility in 1981 and up until 1984, sludge generated by the wastewater treatment system was transported to an off-site commercial landfill in Watervliet, Michigan (S00332). The documents do not indicate the exact dates of disposal, or the manner of transportation. Note that the use of off-site commercial landfills for the disposal of wastewater treatment sludge did not start until 1981, 18 years after the cessation of de-inking operations at the Mill.
- Beginning in 1984, sludge generated by the wastewater treatment system was hauled by a commercial hauler from Allegan, Michigan, to an off-site commercial landfill located in Three Rivers, Michigan (S00332). The documents do not indicate the exact dates of disposal.
- Beginning in February of 1985, all solid wastes, including wastewater treatment sludge, fly ash, and bottom ash, were hauled by a commercial hauler from Kalamazoo, Michigan, and was disposed of at the Cork Street Landfill (Kalamazoo, Michigan) (S00735). The documents do not indicate the exact dates of disposal.
- In 1983, the remaining sludge in the rest of the lagoons was consolidated in the last four lagoons (along the western property boundary) (S07280).
- In February of 1984, the aeration stabilization pond was abandoned and replaced by an activated sludge treatment system. The wastewater was treated first in the primary clarifier, then in the activated sludge treatment system, and finally in a secondary clarifier (S20133; S13795-S13796). The sludge was dewatered in the mechanical belt press prior to off-site disposal at a commercial landfill.

(vi) PCB analytical results for any sludge samples.

- In April of 1981, a sludge sample collected from the primary clarifier reportedly contained less than 1.0 milligrams per liter (mg/L) PCBs(S18428).
- In October of 1981, a sludge sample collected from an unknown location within the wastewater treatment system reportedly contained less than 10 parts per billion (ppb) PCBs (S18483).
- In 1984, a composite sludge sample reportedly contained less than 0.0001 mg/L PCBs (S12185).

e) Describe all types of monitoring reports, monitoring data, and documentation sent to or received by regulatory authorities. Provide all such information and documentation to the depository.

We found only a few types of communications to or received by the regulatory authorities. A majority of the communications were sent to the Water Resources Commission / Michigan Department of Natural Resources (WRC/MDNR). These communications address the following issues:

- Notices of Noncompliance in response to NPDES permit requirements.
- Monthly operating reports. (S12458-S12473, S13387-S13420, S13427-S13464, S13466-S13605, S13608-S13655, S14420-S14521, S14525-S14532, S14534-S14549, S14558-S14567, S14569-S14570, S14573-S14587, S14590-S14613, S14623-S14642, S14644-S14645, S14648-S14649, S15503-S15608, S15610, S15612, S15614, S15616-S15635, S15637-S15655, S15657, S15659, S15661, S15663-S15721, S15733-S15752, S15754-S15784, S15794-S15807, S15812-S15815, S15817-S15824, S15826-S15839, S15843-S15844, S15853-S15905, S15907-S15914, S15916-S15919, S15922-S15943, S17969-S18038, S18044-S18096, S18098-S18168, S19883-S19889, S19940-S19963, S19980-S19996, S20006-S20007, S21011-S21018, 063232-063564).
- Redefinition of Outfalls 006 and 007 as self monitored outfalls (S12228-S12230, S12247, S12249).
- Outfall permit applications (S12189-S12209, S12228-S12230, S14749-S14752, S14768-S14799, S14789-S14809, S14841-S14849, S14910, S14913-S14919, S14928, S14960, S14989-S14994, S15006-S15019, S20489-S20501, S20505-S20510, S20557-S20609, S20726-S20794, S20803-S20804, S21111-S21126, S21138-S21144, S21155, 063205-063231, 063616-063702).

These documents were included in the information provided to the depository. Documentation of the Notices of Noncompliance in response to NPDES permit requirements are discussed in the response to Question 36.

f) **Describe all types of design reports and/or basis of design documentation for the treatment system. Provide all such information and documentation to the depository.**

The following design and/or system assessment reports were found:

- The Mill installed a 55' diameter primary clarifier in July, 1954 as recommended by the consultants Hubbell, Roth and Clark (S24500).
- November 1966: Quirk, Lawler & Matusky Engineers – Waste study and abatement programs, including an evaluation of in-mill changes and the development of specific design criteria (S22255-S22378).
- June 1975: Commonwealth Associates Inc. – Program for Water Pollution Abatement Plainwell Paper Company (S20278-S20351).
- April 1982: Williams and Works – Plainwell Paper Company Wastewater Treatment Plant Evaluation (S16950-S16990).

- January 1990: Ecologix Inc. – Investigation of Potential Improvements to the Wastewater Treatment Plant Aeration System for the Simpson-Plainwell Paper Company (S13786-S13829).

g) For any facility that discharged wastewater to the local POTW or had direct discharge of untreated wastewater, identify what percentages and quantities of the total flow were sent to the various discharge points.

From 1947 to July, 1954, a number of pilot, demonstration, and full-scale primary clarification trials treated up to 30 to 70% of the discharge of the Mill (0064624-0064679; 0064341-0064360; S24498-S24500). Beginning in July 1954, all process wastewater was treated prior to discharge to the Kalamazoo River with the exception of some process wastewater from the paper making process was discharged directly to the Kalamazoo River through sewer No. 2 (Outfall 002) until 1966 (S24577).

The documents reviewed provided no information indicating that wastewater was ever discharged to a POTW. An undated document does indicate that approximately 35,000 gallons per day of domestic wastewater (i.e., sanitary wastewater) was discharged to the City of Plainwell Municipal Treatment Plant (S14989).

h) For any POTW referred to in (g), above, provide any and all information, including but not limited to monitoring data, on the amount of wastewater discharged to the POTW, the location of the discharge point, and the concentration of PCBs in the wastewater discharge to the POTW and in the effluent from the POTW.

As stated above, no information has been found that indicates process wastewater was ever discharged to a POTW. As a result, there is no evidence that PCBs were ever discharged to a POTW. Note that sanitary wastewater from the Mill was discharged to the local POTW (S14989).

i) Describe any decommissioning activities conducted when individual unit processes were taken off line.

The components of the old wastewater treatment system (replaced in 1981 and 1984, respectively) were either removed or abandoned in place (S07279). In 1983, sludge residuals remaining in the sludge dewatering lagoons were consolidated into the last four lagoons (along the western property boundary) (S07280). The lagoons that received the residual sludge were covered with soil and gravel. The other 10 former dewatering lagoons were backfilled with soil after the remaining sludge was removed (KB50402922).

j) Identify all permits and notices of wastewater-related violations issued for your facility (including those related to discharges to or from a POTW).

NPDES permit number MI0003794 covers the discharges from the Mill outfalls (S14983; S14984; S14523). The majority of the Notices of Noncompliance (NON) were for exceeding effluent limitations set forth in their NPDES Permit. Data related to the NON's are provided in the response to Question No. 36 and in Table 11.

Question No. 29: Information on Lagoons, Landfills and Impoundments

Identify and describe each lagoon, landfill, or impoundment on your property, past or present. Please identify and describe each off-site lagoon, landfill, or impoundment used for disposal of wastewater treatment sludges, pulp or paper production sludges, or any other materials potentially containing PCBs, past or present. For each such on or off-site lagoon, landfill, or impoundment, please include:

a) Contents, treatment processes, and the destinations of its content if any removal actions were conducted).

12th Street Landfill

The 12th Street Landfill is located on property owned by the Mill approximately 1.5 miles northwest of the Mill property. It was used to dispose of sludge generated from the Mill's wastewater treatment plant (S07279; S22384). Sludge generated from primary and secondary wastewater treatment operations was first dried in a series of dewatering lagoons prior to being transported to the 12th Street Landfill for disposal (see below for additional details on the dewatering lagoons). In addition to paper sludge, the landfill also includes a minor amount of waste lumber, concrete, bale wire, crushed empty drums, and various types of construction debris (Geraghty & Miller, p. 2-1, 1997).

Dewatering Lagoons

A series of dewatering lagoons were located on Mill property in the area of the wastewater treatment plant. These lagoons were used to dewater wastewater treatment sludge prior to its transport and disposal at the 12th Street Landfill. Beginning in the mid-1950s, sludge was pumped from the wastewater treatment system to 12 drying lagoons west of the Mill. Beginning in 1955, the dried sludge was removed by a contractor and trucked to the 12th Street Landfill (S22043; S26480; S26484). In 1967 or 1968, two additional drying lagoons were built, bringing the total to 14 (S22096). Sludge removed from the drying lagoons was disposed of at the 12th Street Landfill until 1983. Supernatant (i.e., clarified liquid that forms above the settled sludge) from the sludge lagoons was pumped back to the aeration lagoon (S20546).

Off-Site Commercial Landfills

Following the implementation of a mechanical dewatering system in 1981, the Mill used several off-site commercial landfills for disposal of its wastewater treatment sludge, along with other solid waste generated at the Mill (S00332; S00735; S12273). These commercial landfills included the Cork Street Landfill in Kalamazoo, Michigan (S00735), the C&C Landfill in Marshall, Michigan (S12273), and two other landfills more than one mile from the Kalamazoo River, Portage Creek, or their tributaries. Note that the use of off-site commercial landfills for the disposal of wastewater treatment sludges did not start until 1981.

b) Location. Please provide a location map if possible.

12th Street Landfill

The 12th Street Landfill is located approximately 1.5 miles northwest of the City of Plainwell's downtown business district. It is located along the west bank of the Kalamazoo River immediately downstream of the former Plainwell Dam site (KB50402845). A copy of Figure 2-1 from the Focused Feasibility Study (Geraghty & Miller, 1997), is provided to illustrate the location of the 12th Street Landfill (Attachment 5).

Dewatering Lagoons

The dewatering lagoons were located on the northwest end of the Mill, set back from the Kalamazoo River. The Mill is located at 200 Allegan Street in the City of Plainwell, Michigan. A copy of Figure 3 from Technical Memorandum 15 (BBL, 1996a), is provided to illustrate the location of the former dewatering lagoons (Attachment 6).

Off-Site Commercial Landfills

As discussed above, the commercial landfills, which have received wastewater treatment sludge from the Mill, include landfills in Watervliet and Three Rivers, Michigan (S00332), the Cork Street Landfill in Kalamazoo, Michigan (S00735), and the C&C Landfill in Marshall, Michigan (S12273).

c) The dates of use or operation.

12th Street Landfill

Based on available aerial photographs, it appears that the 12th Street Landfill began accepting wastewater treatment sludge in 1955 (BBL, pp. 3-34, 1992). This correlates well with the known startup date of the primary clarifier (July 1954) (S24577) and the fact that sludge was first transferred to the dewatering lagoons and dried for several months before being transported to the 12th Street Landfill (S07279). The sludge produced from the wastewater treatment system continued to be disposed of at the 12th Street Landfill until a mechanical sludge dewatering system was placed in operation in August 1981 (S22384-S22385; S07280). Sludge remaining in a number of the sludge dewatering lagoons was also removed and disposed of at the 12th Street Landfill in 1981 (S07280).

Dewatering Lagoons

The initial dewatering lagoons were constructed in 1954 as part of the wastewater treatment system. Based on available aerial photographs, it appears that there were 10 dewatering lagoons present in 1955 (BBL, pp. 3-31, 1992). Subsequent aerial photographs indicated a total of 12 dewatering lagoons in 1960 and 14 in 1967 (BBL, pp. 3-31 and 3-32, 1992). The dewatering lagoons were used to dewater sludge generated at the wastewater treatment plant up until August of 1981, at which time a mechanical dewatering system was placed in operation (S22384-S22385; S07280). In 1981, sludge was removed from some of the dewatering lagoons and disposed of at the 12th Street Landfill (S07280). In 1983, the remaining sludge was consolidated in the last four lagoons (along the western property boundary) (S07280).

Off-Site Commercial Landfills

As indicated above, the Mill has used several off-site, commercial landfills for disposal of its wastewater treatment sludge following the startup of a mechanical dewatering system in August of 1981 (S07280; S00332; S00735; S12273).

d) **Any and all activities or efforts to close or otherwise take a lagoon, landfill, or impoundment out of service, or any remediation or removal activities or efforts with respect to any lagoon, landfill, or impoundment, or their contents, including without limitation any capping, solidification, stabilization, containment, on or off-site disposal, treatment, or decommissioning thereof. Please provide the dates for each activity or effort.**

12th Street Landfill

To contain the waste material within the landfill, a retaining berm was constructed around portions of the landfill perimeter. The first evidence of a retaining berm, which was built along the southeast and east perimeter of the disposal area, is apparent in the 1967 aerial photograph (BBL, Fig. 57, 1992). This original retaining berm is located in Figure 2-1 the Sampling and Analysis Plan for the 12th Street Landfill (RMT, 1990) (S26491). Several berms were constructed over time using soil, fly ash, and dried sludge (Gren, p. 135, 1997). Based on the findings from the remedial investigation, it was determined that the retaining berm was constructed around the north, east, and west sides of the landfill, rising to heights of up to 20 feet above the surrounding grade (Geraghty & Miller, p. 3, 1996b).

In 1984, the 12th Street Landfill was covered with a layer of soil and seeded (S07280). This closing procedure was approved by the MDNR (S14859). Based on the remedial investigation findings, the existing soil cover across the landfill is approximately 2 to 7 feet thick and vegetated with grass and small shrubbery (Geraghty & Miller, pp. 3, 11, 1996b). The Record of Decision (ROD) for the 12th Street Landfill has not yet been issued. However, additional closure actions are underway on an interim basis, with Michigan Department of Environmental Quality (MDEQ) oversight, pursuant to Michigan law and the National Contingency Plan. These additional closure activities include: consolidation of residuals beyond the proposed landfill cap boundaries; installation of a flexible membrane liner landfill cap in compliance with Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); and institutional controls (Geraghty & Miller, 1997).

Dewatering Lagoons

The dewatering lagoons were used for sludge dewatering until 1981, when a mechanical dewatering process was installed (S22384-S22385). Residual sludge remaining in several of the dewatering lagoons was subsequently removed and deposited in the 12th Street Landfill (S07280). In 1983, sludge residuals remaining in the sludge dewatering lagoons were consolidated into the last four lagoons (along the western property boundary) (S07280). The lagoons that received the residual sludge were then covered with soil and gravel, and now support a vegetative cover. The other 10 former dewatering lagoons were backfilled with soil after the remaining sludge was removed (KB50402922). This closure procedure for the former dewatering lagoons was approved by the MDNR (S14859). A portion of the current wastewater treatment system is located on top of the former sludge dewatering lagoons.

e) The dimensions and volume by source of materials disposed of within the lagoon, landfill, or impoundment (include calculations of volumes, if available).

12th Street Landfill

The lateral area of waste material at the 12th Street Landfill is approximately 320,920 square feet. The maximum thickness of waste material is approximately 24.5 feet. The estimated volume of waste material is 206,149 cubic yards (refer to Attachment 7 for the calculations that were made to develop this estimate). Although there was some miscellaneous construction debris in the landfill, the vast majority of the waste material is papermaking sludge (Geraghty & Miller, Fig. 2-5, 1997 (Attachment 8)).

Dewatering Lagoons

All of the sludge remaining in the dewatering lagoons in 1983 was consolidated into the last four lagoons (along the western property boundary) in preparation for the construction of a new secondary activated sludge process (S07280). As such, the estimated area and volume of the remaining sludge within the former dewatering lagoons are based on the available information for the four lagoons adjacent to the western property boundary. The lateral area of these four former dewatering lagoons was estimated based on the lagoon outlines shown on Figure 25 (Attachment 9) of the Description of the Current Situation (DCS) (BBL, 1992). The depth of the residual sludge in each of the four former lagoons was determined based on the soil boring data presented in Table 3-4 (Attachment 10) of Technical Memorandum 15 (BBL, 1996a). Based on this information, the estimated lateral area of the four former lagoons is 30,100 ft^2. It is further estimated that approximately 8,739 cubic yards of papermaking sludge remain in these four former lagoons (refer to Attachment 11 for the calculations that were made to develop this estimate).

f) A summary of all environmental investigation data collected for each lagoon, landfill, or impoundment, to the extent available, including:

12th Street Landfill

A comprehensive remedial investigation of the 12th Street Landfill was conducted pursuant to, and in accordance with, the Administrative Order by Consent (1991) issued by the MDEQ for the Remedial Investigation/Feasibility Study (RI/FS) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. The 12th Street Landfill is one of four Operable Units included in the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. The remedial investigation conducted at the 12th Street Landfill included the completion of 14 hand-auger borings, 22 soil borings, 16 test pits, 15 groundwater monitoring wells, and 3 leachate wells. The location of these various sample points are illustrated in Figure 2 (Attachment 12) of the Remedial Investigation (RI) (Geraghty & Miller, 1996b).

Dewatering Lagoons

An environmental investigation of the former dewatering lagoons at the Mill was conducted by BBL as part of the remedial investigation/feasibility study activities for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Residuals and soils in and around the 14 former lagoons were investigated to evaluate the potential presence of PCBs. The locations of the investigation sample points are shown on Figure 3 (Attachment 5) of Technical Memorandum 15 (BBL, 1996a).

(i) Soil boring logs.

12th Street Landfill

Hand auger borings (14 in number) and soil borings (15 in number) were drilled and sampled along the perimeter of the landfill to delineate the lateral extent of paper-making residuals (i.e., paper-making sludges) and to provide chemical characterization of the residuals and the immediately underlying soils. Seven soil borings were also drilled and sampled within the interior of the landfill. A total of 15 groundwater monitoring wells were also installed across the 12th Street Landfill site. The soil boring logs are provided in Technical Memorandum 8 (Geraghty & Miller, 1994a). Based on the boring log information, a series of geologic cross-sections were prepared for the 12th Street Landfill site. The cross-section location map and the individual geologic cross-sections are shown on Figures 2-4 (Attachment 13) and 2-5 (Attachment 8), respectively, of the Focused Feasibility Study (Geraghty & Miller, 1997).

Dewatering Lagoons

Thirteen soil borings were drilled and sampled within the area of the 14 former lagoons. The soil boring logs are presented in Appendix E of Technical Memorandum 15 (BBL, 1996b). A summary of the findings from these borings (thickness and description of the residuals encountered) is presented in Table 3-4 (Attachment 10) of Technical Memorandum 15 (BBL, 1996a).

(ii) Test pit logs.

12th Street Landfill

In 1994, 16 test pits/trenches were excavated within the 12th Street Landfill to further evaluate the waste material present in the landfill. The test pits/trenches were excavated at locations where geophysical anomalies had been detected during electromagnetic and magnetic surveys conducted previously at the site (Geraghty & Miller, 1994c). The test pits/trenches were excavated with a backhoe to an estimated depth of 2 feet above the landfill base. The results of the test pit/trench investigation indicated the electric/magnetic anomalies to be a result of wire, several empty drums, and miscellaneous construction debris within the landfill. The locations of the test pits/trenches are shown on the attached Figure 2 (Attachment 12) from the RI (Geraghty & Miller, 1996b). The test pit logs are contained in Appendix A of Technical Memorandum 8 (Geraghty & Miller, 1994c).

Dewatering Lagoons

No information was found to indicate that test pits were ever excavated in the former sludge dewatering lagoons.

(iii) PCB analytical data for sludge, soil and groundwater samples (include table(s) and/or figure(s) itemizing sample location, sample depth, sample interval, and both total PCBs and Aroclor-specific analytical results).

12th Street Landfill

The PCB analytical results for the sludge (residuals) and soil samples collected from soil borings completed during the remedial investigation for the 12th Street Landfill are summarized in Table 3-8 (Attachment 14) of Technical Memorandum 8 (Geraghty & Miller, 1994a). PCB analytical data for sludge (residuals) samples collected from test pits/trenches completed during the remedial investigation for the 12th Street Landfill are summarized in Table 3-3 (Attachment 15) of the Test Pit Investigation Technical Memorandum (Geraghty & Miller, 1994c).

PCBs were detected in the paper-making sludge (residuals) within the 12th Street Landfill. The average and maximum detected PCB concentrations within the residuals are 24.3 milligrams per kilogram (mg/kg) and 158 mg/kg, respectively. One aspect of note is the fact that the highest PCB concentrations were generally found in the deepest portions of the landfill. Figure 9 illustrates the stratification of PCB concentrations along the north-south cross-section through the landfill. As illustrated in Figure 9, the residuals present in the lower depths of the landfill have significantly higher PCB concentrations than do the residuals in the middle and upper portions of the landfill. This finding correlates with the waste deposition sequence at the 12th Street Landfill and the timeline for de-inking operations at the Mill (i.e., the deeper the sludge, the longer ago it was deposited). As shown on Figure 9, the PCB concentrations within the lowest 10 feet of sludge were generally greater than 10 mg/kg, while the PCB concentrations in the upper 15 feet of the landfill were generally less than 1.0 mg/kg.

The PCB analytical data for groundwater samples collected in September 1993 from 15 site groundwater monitoring wells are summarized in Table 3-12 (Attachment 16) of Technical Memorandum 8 (Geraghty & Miller, 1994a). The PCB analytical data for groundwater samples collected in August 1995 from 15 site groundwater monitoring wells are summarized in Table 5 (Attachment 17) of the RI (Geraghty & Miller, 1996a). The data indicate that PCBs have never been detected in groundwater samples collected from the site.

Dewatering Lagoons

The PCB analytical results for the sludge (residuals) and soil samples collected from soil borings completed during the dewatering lagoon investigation at the Mill are summarized in Table 3-5 (Attachment 18) and Figure 10 (Attachment 19) of Technical Memorandum 15 (BBL, 1996a). All but two samples collected from the former dewatering lagoons area had very low (less than 0.3 mg/kg) to non-detectable levels of PCBs. The highest PCB concentration measured was 1.6 mg/kg within a sample collected from a 0.2 feet thick layer of residuals (sludge) found at a depth of 10 feet below grade at Soil Boring SPL-11.

(iv) Density and moisture content data for sludge samples.

12th Street Landfill

The moisture content of the sludge samples collected during the remedial investigation ranged from approximately 20% to 66%, with an average moisture content of approximately 48%. The moisture content results for each of the collected sludge samples are listed on the analytical data sheets included in Technical Memorandum 8 (Geraghty & Miller, 1994b). Representative moisture content data is summarized in Table 9 of this response. Sludge density data were not collected during the remedial investigation of the 12th Street Landfill. However, based on similar sludge characteristics, it is assumed that the density of the sludge at the 12th Street Landfill Operable Unit would be comparable to the sludge density measured at the King Highway Landfill Operable Unit. The average sludge density, on a dry weight basis, measured for the King Highway Landfill Operable Unit was 27.4 pounds per cubic feet (lb/ft^3) (personal communications between Michael Maierle of ARCADIS Geraghty & Miller and Chris Torell of BBL, January 7, 2001; data summary is included in Attachment 7). Based on this data, the estimated sludge density, on a dry weight basis, for the 12th Street Landfill Operable Unit is 27.4 lbs/ft^3. This estimated sludge density was used in the estimated PCB mass calculations presented in the response to Question No. 29 (g) below. Note that dry weight densities must be used for PCB mass calculations because the PCB analytical data is presented on a dry weight basis.

Dewatering Lagoons

The moisture content of the sludge samples collected during the investigation of the dewatering lagoons at the Mill ranged from approximately 53% to 62%. The moisture content results for each of the collected sludge samples are listed on the analytical data sheets included in Appendix C of Technical Memorandum 15 (BBL, 1996b). No sludge density data was collected for the dewatering lagoons at the Mill. However, it is assumed that the density of the remaining sludge would be approximately equal to the density of sludge at the 12th Street Landfill and other similar operable units. Based on the data interpretation presented above, under the response to part (f)(iv) of this question regarding the 12th Street Landfill, the assumed sludge density, on a dry weight basis, for the remaining sludge present in the dewatering lagoons at the Mill is 27.4 lbs/ft^3.

g) Estimated mass of PCBs within lagoon, landfill, or impoundment (prior to initiating any remedial activities that were conducted). Please include all calculations and assumptions that lead to this estimate.

12th Street Landfill

The PCB analytical results from 61 residual samples collected from borings and test pits in the 12th Street Landfill provide sufficient data to estimate PCB mass. There are a number of different ways to calculate the PCB mass in a landfill. Simple arithmetic mean method calculations are included in response to this questionnaire by agreement among the parties. Using an arithmetic mean method, the estimated mass of PCBs contained in the 12th Street Landfill is 3,738 pounds (1,696 kilograms). Please refer to Attachment 7 for the calculations that were made to develop this estimate.

Dewatering Lagoons

The estimated mass of PCBs contained in the four former dewatering lagoons that contain residual sludges is 5.77 pounds (2.62 kilograms). Please refer to Attachment 11 for the calculations that were made to develop this estimate.

h) Construction drawings or as-built drawings illustrating the size, dimensions, and configuration of the lagoon, landfill, or impoundment, and the deposition of waste materials within the lagoon, landfill, or impoundment.

12th Street Landfill

We found no drawings or as-built drawings for the 12th Street Landfill. As discussed in the response to Question 29(d), a retaining berm was constructed around portions of the landfill perimeter. The berms were installed to contain the waste material within the landfill (Gren, p. 134, 1997). The first evidence of a retaining berm, which was built along the southeast and east perimeter of the disposal area, is apparent in the 1967 aerial photograph (BBL, Fig. 57, 1992). This original retaining berm is located in Figure 2-1 the Sampling and Analysis Plan for the 12th Street Landfill (RMT, 1990) (S26491). Several berms were constructed over time using soil, fly ash, and dried sludge (Gren, p. 135, 1997). Based on the findings from the remedial investigation, it was determined that the retaining berm was constructed around the north, east, and west sides of the landfill, rising to heights of up to 20 feet above the surrounding grade (Geraghty & Miller, p. 3, 1996b). As shown on Figure 2-5 of the Focused Feasibility Study (Geraghty & Miller 1997) (Attachment 8), the top of the berms range in elevation from 710 feet to 733 feet above mean sea level. In 1984, the 12th Street Landfill, including the perimeter berms, was covered with a layer of soil and seeded in accordance with a closure procedure approved by the MDNR (S07280, S14859).

The pattern of sludge disposal and the expansion of the disposal area over time can be inferred from available aerial photographs. Copies of the relevant aerial photographs are included in the DCS (BBL, 1992; 1950 – Figure 56, 1955 – Figure 57, 1960 – Figure 58, 1967 – Figure 59, 1974 – Figure 51, 1981 – Figure 52, 1986 – Figure 53, and 1991 – Figure 60). In their Sampling and Analysis Plan for the 12th Street Landfill, RMT prepared a series of drawings to illustrate their interpretation of sludge disposal patterns based on the aerial photographs (S26484-S26491). In addition, the cross-section maps generated from the remedial investigation data illustrate the general stratigraphy of the waste material deposited in the 12th Street Landfill (Figure 2-5 of Geraghty & Miller, 1997). These maps are provided as part of Attachment 8.

Dewatering Lagoons

We found no construction drawings or as-built drawings for the sludge dewatering lagoons.

i) **Any information regarding known or suspected releases or spills of materials from any lagoon, landfill, or impoundment into the Kalamazoo River or its tributaries.**

12th Street Landfill

We have found no conclusive evidence that sludge or other materials from the 12th Street Landfill was ever released or spilled into the Kalamazoo River or its tributaries. During the remedial investigation of the 12th Street Landfill Operable Unit, paper-making residuals were found on the Kalamazoo River riverbed approximately 5 feet from the landfill berm (Geraghty & Miller, 1996b). Two samples of the residuals (SD-1 and SD-2) were collected approximately 3 feet from each other and analyzed for PCBs (reference Figure 2 from the Remedial Investigation Report; Attachment 12). Both samples contained PCBs (the analytical results indicated total PCB concentrations of 17 mg/kg and 29 mg/kg for Residual Samples SD-1 and SD-2, respectively). The lateral extent of residuals along the riverbed contiguous to the 12th Street Landfill was not determined during the remedial investigation. These paper-making residuals found along the riverbed adjacent to the 12th Street Landfill could have been a result of releases from the landfill and/or from upstream sources.

It is important to note that any residuals that may have been released from the 12th Street Landfill to the Kalamazoo River may or may not have contained PCBs, depending on the date of their release. With the cessation of de-inking operations in January 1963 (S24577), the sludge that was deposited in the 12th Street Landfill starting in late 1963 would likely have contained little or no PCBs (refer to the response to Question No. 29 (f) for additional information on the sludge deposition sequence). Thus, residuals that may have been accidentally released to the Kalamazoo River after 1963 would likely have contained little or no PCBs.

As described in the Remedial Investigation Report (Geraghty & Miller 1996b) and the Focused Feasibility Study (Geraghty & Miller 1997) of the 12th Street Landfill, paper-making residuals are present in portions of the wetlands beyond the berm on the north and west side of the landfill and in the woodland area to the southeast. Where present outside the berm of the landfill, the residuals range in thickness from several millimeters to tens of centimeters (Geraghty & Miller 1997). Of the 21 samples of surface soil and residuals collected outside the landfill berm during the remedial investigation (see Attachment 12), only seven samples exhibited detectable concentrations of PCBs (see Attachment 14). The findings from the remedial investigation are similar to the findings reached during previous sampling of residuals beyond the landfill berm conducted by MDNR and Plainwell in 1987 and 1989 (S26492; S26493). Residuals present beyond the landfill berm will be recovered and consolidated into the landfill prior to capping as part of the remedial action planned for the 12th Street Landfill. Figure 4-1 of the Focused

Feasibility Study (Geraghty & Miller 1997) illustrates the approximate extent of residuals beyond the landfill berm that will be consolidated prior to capping.

Dewatering Lagoons

We found no information indicating any known or suspected release of materials from the dewatering lagoons into the Kalamazoo River or its tributaries. The results from the 1994 Mill Investigation Study conducted by BBL (1996a) did not indicate any signs of previous releases or spills from the former dewatering lagoons. BBL concluded that no response actions were necessary for the former dewatering lagoons based on the data from the 1994 Mill Investigation (BBL, 1996a). Furthermore, MDEQ has never requested further response actions following the 1994 Mill Investigation (BBL, 1996a)

j) An indication whether the lagoon, landfill, or impoundment is, or ever was, lined and, if so, the type of liner and an estimate of its hydraulic conductivity.

12th Street Landfill

The 12th Street Landfill was not lined. Although the landfill is not lined, the paper-making sludge in the landfill is nearly impermeable and serves as a hydraulic confining body. The hydraulic conductivity of the paper-making sludge is typically four to five orders of magnitude less than the underlying aquifer materials (Geraghty & Miller, 1996b). As discussed in the response to Question No. 29 (f)(iii) above, PCBs have never been detected in groundwater samples collected from the 12th Street Landfill site.

Dewatering Lagoons

The dewatering lagoons were not lined. Similar to the 12th Street Landfill, the paper-making sludge that was temporarily stored in the former lagoons had a low hydraulic conductivity and served as a hydraulic confining body. Note that the results from a 1973 groundwater investigation of the former dewatering lagoons conducted by Williams & Works concluded that the lagoons were not causing any groundwater contamination (S20263).

k) To the extent not answered in Question 28, for any discharges to a POTW, provide any and all information on the amount of sludge produced to the POTW, the amount of sludge produced at the POTW as a result of the treatment of discharges to the POTW from (at least in part) your property, the location of the disposal site(s) for the POTW-sludge, and the concentration of PCBs in the POTW sludge.

We found no indication that process wastewater was ever discharged to any POTW. As a result, no PCBs were discharged from the Mill to any local POTW.

Outfalls and Releases:

Question No. 30: Outfalls to Kalamazoo River

Please identify and describe any and all outfalls to the Kalamazoo River or its tributaries, past or present, from your property. Please include dates of use, and each outfall's source and the receiving body. Please include a figure identifying the source and location of each outfall. If different than the wastewater effluent data requested in Question 28, please provide all available PCB, BOD, TSS, TDS and TVS data for each of these outfalls.

The following information was found regarding outfalls to the Kalamazoo River. All outfalls discharged to the Kalamazoo River only.

Outfall 001

- 1968 – Outfall 001 discharged freshwater (non-contact cooling water) from the three paper machines (S24580).
- 1973 – Outfall 001 discharged storm water only (S20491).

Outfall 002

- Pre-1966 – Outfall 002 (Sewer No. 2) discharged directly to the Kalamazoo River (S24568-S24569). This outfall contained, in unknown proportions, sources such as non-contact cooling water, white water overflow from Paper Machine No. 2, **and process water from the paper coating operations (S22082).**

- 1968 – Outfall 002 discharged freshwater (non-contact cooling water) from the three paper machines (S24580).
- 1973 – Outfall 002 discharged non-contact cooling water from the three paper machines and the boiler plant (KS01400002).
- 1975 – Outfall 002 discharged non-contact cooling water from the No. 2 paper machine, as well as floor and roof drainage (S21002).
- 1976 – Outfall 002 discharged non-contact cooling water from the calendar stacks on the No. 2 paper machine, as well as floor and roof drainage (S21042).
- Outfall 002 was abandoned in 1976 (S14974).

Outfall 003

- **1965 – Outfall 003 discharged clear water from the boiler house, as well as process water from the paper coating materials preparation process (S22082).**

- 1968 – Outfall 003 discharged clear water from the boiler house (S24580).
- 1973 – Outfall 003 discharged non-contact cooling water from the three paper machines and the boiler plant (KS01400002).
- 1975 – Outfall 003 discharged non-contact cooling water from the No. 3 and No. 4 paper machines, as well as floor and roof drainage (S21002).
- 1976 – Outfall 003 discharged non-contact cooling water from the No. 3 and No. 4 paper machines, as well as floor and roof drainage (S21042).
- Outfall 003 was abandoned in 1976 (S14974).

Outfall 004

- 1968 – Outfall 004 was an emergency overflow from the sump pit that collected wastewater prior to being transferred to the wastewater treatment plant (S24580).
- 1973 – Outfall 004 discharged non-contact cooling waste from the three paper machines and the boiler plant (KS01400002).
- 1975 – Outfall 004 discharged condenser cooling water, boiler condensate, and floor drainage (S21002).
- 1976 – Outfall 004 discharged condenser cooling water, boiler condensate, and floor drainage (S21042).
- 1979 – Outfall 004 discharged compressor cooling water, non-contact cooling water, and some surface runoff (S18462).
- 1985 – Outfall 004 discharged non-contact cooling water (S21550).

Outfall 005

Historical documents from the 1950s through the mid-1960s do not identify a numeric outfall number for the effluent discharge from the wastewater treatment plant at the Mill. Starting in the early 1970s, the wastewater treatment plant effluent outfall was identified as Outfall 005. For consistency, Outfall 005 is used to identify the wastewater treatment plant effluent outfall dating back to 1954.

- Prior to 1967 - Outfall 005 discharged the primary treated wastewater (effluent from the 55-foot diameter clarifier) and is estimated to have been located within 100-feet downstream of Outfall 004 (Figure 1 of this Response; Attachment 6). In order to meet the State ordered discharge limits of 10 lb TSS per ton of production (approximately 11,000 lb/day for a 110 ton/production day), a lift station/sump pit was used to transfer de-inking and bleaching washer wastes and most white waters with elevated TSS and BOD to the primary clarifier (0064485-0064523; 0064529-0064532).

- 1968 - The location of Outfall 005 was moved due to the construction and operation of the new secondary wastewater treatment clarifier (Figure 1 of this Response). With the coming of secondary wastewater treatment, a number of piping and wet well improvements were made to transfer all Mill wastewaters with significant BOD or TSS loads to the primary clarifier, and from there to an aerated stabilization basin near the sludge dewatering lagoons (S22088-22091; S20121).
- 1973 – Outfall 005 (#030049) discharged treated process water from the wastewater treatment plant (KS01400002).
- 1975 – Outfall 005 discharged treated process water from the wastewater treatment plant (S21002).
- 1976 – Outfall 005 discharged treated process water from the wastewater treatment plant (S21042).
- 1979 – Outfall 005 discharged treated process water from the wastewater treatment plant (S18462).
- 1985 – Outfall 005 was moved again following the installation of the activated sludge treatment system between 1984 and 1985 (064461; 064469). Outfall 005 discharged treated process water from the final clarifier (S21550).
- 1988 – Outfall 005 discharged treated process water from the final clarifier (S13302).
- 1993 – Outfall 005 discharged treated process water from the final clarifier (063207).
- 2000 – Outfall 005 discharged treated process water from the final clarifier (063647).

Outfall 006

- 1991 – Outfall 006 discharged non-contaminated well water generated during the testing of the fire protection pumps (S12247).
- 1993 – Outfall 006 discharged non-contaminated water from the testing of fire protection pump No. 1 (063207).
- 2000 – Outfall 006 discharged non-contaminated water from the testing of fire protection pump No. 1 (063647).

Outfall 007

- 1991 – Outfall 007 discharged non-contaminated well water generated during the testing of fire protection pumps (S12247).
- 1993 – Outfall 007 discharged non-contaminated water from the testing of fire protection pump No. 2 (063207).
- 2000 – Outfall 007 discharged non-contaminated water from the testing of fire protection pump No. 2 (063647).

The following figures are provided as Attachments 20-25 to illustrate the locations of the outfalls that have been utilized at the Mill:

- 1973 (Attachment 20) – Outfall location map from the April 1973 Michigan Water Resources Commission (MWRC) wastewater survey (KS01400011).
- 1974 (Attachment 21) – Outfall location map, dated May 1974, from the May 1975 MWRC wastewater survey (S21007).
- 1976 (Attachment 22) – Outfall location map, dated April 1973, from the August 1976 MWRC wastewater survey (S21047).
- 1979 (Attachment 23) – Outfall location map from the September 1979 MWRC wastewater survey (S18478).
- 1989 (Attachment 24) – Outfall location map from the draft NPDES permit public notice/fact sheet (S00205).
- 2000 (Attachment 25) – Outfall location map from the March, 2000, NPDES permit application (063647).

Figures 1 and 3 - 6 indicate the change over time in the number and location of outfalls. The available data on PCBs, BOD, TSS, TDS, and TVS is the same as provided in the response to Question No. 28. Data for Outfalls 002, 003, and 004 can be found in Table 2. Data for Outfall 005 can be found in Table 1.

Question No. 31: Releases to Kalamazoo River

To the extent not otherwise provided above, please provide any information you have related to the amount of paper waste, sludge, storm water, treated or untreated effluent, or other materials from your facilities released to the Kalamazoo River or its tributaries from your property. To the extent possible, please describe the nature of such releases, and the dates thereof.

We found limited information regarding any releases of paper waste, sludge, storm water, treated/untreated effluent, and other materials from the Mill into the Kalamazoo River that have not been previously addressed. The response to this question focuses primarily on unpermitted releases, such as emergency bypasses and leaks, based on reports from sources internal and external to the Mill. The limited amount of information concerning known or documented releases can be found in Table 10.

Some anecdotal information indicates that, some time between 1961 and 1970, there may have been some loss of white water through what is thought to be an emergency bypass (Burd, pp. 68-70, 1997). In addition, in 1974, bypass pipes that could theoretically allow untreated wastewater to be discharged to the River were identified and closed/cemented (Gren, pp. 167-172, 1997). However, there is no indication of whether, when, or if untreated wastewater was discharged through these pipes.

Some documents were found from the 1970s indicating bypasses of the primary clarifier, usually to allow the primary clarifier to be repaired (064784; 064786; 064787; KS01500594; S14999; S16890; S20503). As discussed in the response to Question No 28 (b), the Mill had procedures in place to address the possibility of having to bypass the primary clarifier during repairs or maintenance (S21193). At these times, wastewater was bypassed around the primary clarifier and sent to the secondary clarifier. A review of the primary clarifier bypass documents listed above indicates that this procedure was in place. When documents do not explicitly indicate that wastewater was diverted to secondary treatment, the presence of secondary effluent data (i.e., TSS, BOD, percent reduction) demonstrates wastewater was flowing to secondary treatment and not to the Kalamazoo River. Therefore, these bypasses of the primary clarifier are not included in Table 10.

Information regarding permitted releases can be found in the responses to Question Nos. 14 (b), 17 (b), 20 (b), 26 (b), 28 and 30. Additional information regarding permit exceedances is located in the response to Question No. 36. PCB releases to the Kalamazoo River are addressed in the response to Question No. 32.

Question No. 32: PCB Releases to Kalamazoo River

Identify all known spills, leaks, releases, or acts of disposal of PCBs from your property or facility to the Kalamazoo River, its tributaries, or to any other property. For each, please include the date(s) of each release, and their nature, source, location, and amount. Also, describe any remediation undertaken. Provide a location map if possible.

We found no additional information concerning spills, leaks, releases, or acts of disposal of PCBs from the Mill to the Kalamazoo River. Responses to Questions No. 28 and 30 cover all available information concerning the amount of PCBs contained in the wastewater treatment effluent and being released through the permitted outfalls. The response to Question No. 29 covers all available information concerning the release of PCBs to the Kalamazoo River by means of any lagoons, landfills, or impoundments. The response to Question No. 31 covers all available information, not covered previously, concerning the release of materials to the Kalamazoo River.

Question No. 33: PCB Spill Information

Identify all known spills, leaks, releases, or acts of disposal of PCBs on your property. For each, please include the date(s), and its nature, source, location, and amount. Also, describe any remediation undertaken. Provide a location map if possible.

We found no information concerning spills, leaks, releases, or acts of disposal of PCBs on Mill property. Off-site disposal information can be found in the responses Question No. 35.

IV. Other Questions

Use of PCBs and PCB-Containing Materials:

Question No. 34: Use of PCB Materials

Please identify and describe any operations on your property, other than those described above, that included the use of any PCBs or materials containing PCBs. For each of the operations described, please provide the following information (and reference any and all records or documents that indicate):

Electrical operations and the operation of some of the Mill's equipment, including elevators, required the use of PCB-containing materials.

a) The dates of such operations.

We found no information on the dates of such operations.

b) The PCBs or PCB-containing materials used.

Transformers and capacitors containing PCBs were used for electrical operations within the Mill (S21163-S21165; S12421-S12422). PCB-containing hydraulic oil was contained within some of the Mill's equipment (e.g., elevators), **but do not appear to have been used in paper machines or forklifts** (S12316; S12319; **S23067-S23072; S23087**). No other PCB-containing materials were used within the Mill.

c) The handling, fate, and disposal of the PCBs or PCB-containing materials.

All electrical equipment containing PCBs were replaced and/or removed during the 1970s, 1980s, and 1990s (S19387-S19388; S19469-S19470; S12285; S12346; S12347; S12309; S12311; S12314; S12300; S12302; S12303; Responses to 2nd Interrogatories, p. 19, 1997). **It does not appear that draining and/or retrofilling of the equipment was performed, but appears that all PCB-containing equipment was replaced instead (Gren Exhibit #826, Gren, p. 128-130, 1997; S12288; S12457; S12456; S12307; S12308; S12304; S12305; S12299; S12301; S12306; S12291; S12289; S12319).** The handling, fate, and disposal of these materials are discussed in Question No. 35.

Question No. 35: Presence of PCB Materials

Please provide the following information (and reference any and all records or documents that indicate, identify or describe):

a) The type, quantity, and disposal of any hydraulic oils, if any, used at your property that were known or suspected to contain PCBs.

PCB-containing hydraulic and lube oils were used in elevators (S12316-S12320; S23067-S23072). Available information on the handling, disposal, and amount of PCB-contaminated hydraulic oils is as follows:

- A 1993 document lists the types of Mobil oils used in the maintenance department (S23072). PCB-containing hydraulic oils were disposed of in accordance with local, state, and federal regulations (S12286).
- In March 1995, hydraulic oils used within some of the Mill's elevators were found to contain PCBs (S12315-S12320). We found no information on the types or brands of these oils.
- In March 1995, five drums (1,005 kg) of hydraulic oil containing 220 ppm PCBs and one drum (120 kg) of solid debris (i.e., rags, boots) were transported from the Mill to and by DYNEX Environmental Co. for temporary storage. It was later transported from that location to Tipton Environmental Technology for incineration (S12288; S12457; S12456; S12307; S12308; S12304; S12305; S12299; S12301; S12306).
- In June 1995, eleven drums (2,045 kg) of hydraulic oil containing less than 10 ppm PCBs were transported from the Mill to and by DYNEX Environmental Inc. (S12291; S12289; S12319).

- In August 1995, eleven drums of hydraulic fluid from the elevators and of unknown PCB concentrations were disposed of in compliance with all local, state and federal laws and regulations (940 CFR Part 761) (S12286; S12287).

b) The number and handling of transformers and conductors at your property.

We found the following information regarding transformers and capacitors at the Mill.

- In the late 1970s, there is some indication that the Mill had 5 transformers, 86 PCB-containing capacitors in use, and an additional 11 capacitors in storage (S19481). There is evidence that, during this time, PCB-containing transformers and capacitors were properly stored within the Mill while awaiting disposal (S19391).

- In the late 1970s, PCB Waste Disposal Manifests and a Waste Product Record indicate that seven self-contained units (a total of 31.6 gallons) of fluids (600,000 ppm PCB), seven self-contained units (a total of 31.6 gallons) of undrained capacitors (600,000 ppm PCB), and an unspecified quantity and concentration of PCB-contaminated oils were transported for disposal. PCB-containing materials were handled in accordance with federal regulation at 40 CFR Part 761 (S19387-S19388; S19469-S19470).

- An undated document (attached to other PCB-related documents dated August 1980) lists the number of PCB-containing capacitors and transformers and their approximate locations (S16584-S16585). A total of 44 or 45 capacitors and 5 transformers were counted (3 transformers in storage were represented as a single unit) (S16584-S16585).

- Between July and September 1984, 3 drums containing 15 capacitors, 3 75-kilovolt amperes (kVA) transformers (from storage), and 1 drum of debris were transported from the Mill to SCA Chemical Services, Inc. by Marine Pollution Control (S22742; S22756; S22757; S22759; S12414; S12415).

- In 1985, four operational transformers from substations 1, 2, 5, and 6 (two 750-kVA and two 1000-kVA) were replaced by General Electric Company (GE). Two 170-gallon tanks containing transformer fluid containing PCBs and two 375-gallon tanks containing PCB-containing transformer fluid were transported from the Mill to GE by A-1 Disposal Corp. (S12344; S12414-S12415; S12428; S12451; S22756-S22757; S22759).

- In October 1985, two drums of capacitors were disposed of in compliance with all local, state, and federal laws and regulations (S12285).

- By November 1985, the number of capacitors (assumed, but not necessarily confirmed, by the Mill to contain PCBs) was reduced to 30 still in operation (12 4,160-V capacitors and 18 480-V capacitors (S12414-S12416; S12424)). These remaining capacitors were to be replaced and properly disposed (S12423-S12425).

- In May 1986, six drums of capacitors were transported from DYNEX Environmental Technology Inc. to Tipton Environmental by Environmental Transportation Services (S12300; S12302; S12303).

- In December 1986, two 4'x4' boxes of capacitors and four 55-gallon drums of capacitors were disposed of in compliance with all local, state, and federal laws and regulations (S12346; S12347; S12309; S12311; S12314).
- In 1995, 11 drums of debris, 6 drums of capacitors, 3 drums of oil containing greater than 500 ppm PCB and 1 drum of a water and oil mixture were transported from DYNEX Environmental Technology Inc. to Tipton Environmental Technology Inc. by Environmental Transportation Services for incineration (S12300; S12302; S12303).

c) Please describe the procedures and results for testing for PCB content in the materials listed in a) and b), above, at your property. If PCBs were found, please describe the procedures followed for addressing the PCBs contained in the materials.

We found the following information regarding the PCB content of hydraulic oil, transformers, and capacitors at the Mill.

- In April 1993, an analysis of silicone fluid contained within five transformer substations was performed by GE. The PCB content of five transformers containing silicone fluid was reported to be below the detection level of 2.0 ppm (S23090-S23094).
- Between May and June 1993, seven oil samples taken from the No. 18 paper machine, forklifts, and a "waste oil tank" were analyzed for PCB Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260 by KAR Laboratories, Inc. The reported concentration of each Aroclor for all samples was less than 1 mg/kg (ppm) (S23067-S23072; S23087).
- In June 1994, an oil sample taken from the No. 13 transformer was found to contain less than 1.0 mg/kg of PCB Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260. All tests were performed within the maximum U.S. EPA allowable holding times and the results represented the sample as it was received (S23088; S23089).
- In February 1995, five "elevator oil" samples were tested for Aroclors 1016, 1221, 1232, 1242, 1248, 1254 and 1260. Three of the five samples analyzed contained less than 1 mg/kg of each Aroclor. The remaining samples contained 220 mg/kg and 9.8 mg/kg of Aroclors 1232 and 1254, respectively. The samples were performed within the maximum U.S. E.P.A. allowable holding times by KAR Laboratories, Inc. (S12315-S12320).
- In August 1996, GE performed PCB analysis of a transformer substation using American Society of Testing and Materials (ASTM) Method D-4059 for oils and EPA Method 8080 for all other matrices. The sample matrix consisted of PCB in oil, silicone, or other dielectric fluids. The result was less than 1.0 ppm PCB (S23155).

All transformers, capacitors, and hydraulic oils containing detectable amounts of PCBs were disposed of in the late 1970s, 1980s, and 1990s by licensed contractors (S19387-S19388; S19469-S19470; S12285; S12346; S12347; S12309; S12311; S12314; S12300; S12302; S12303; Responses to 2nd Interrogatories, p. 19, 1997).

Environmental Information and Analytical Data:

Question No. 36: Environmental Citations

Please identify and describe any and all notices of violation (NOV), fines, administrative orders, court orders, lawsuits, penalties, or other environmental citations issued, sought, or imposed by any federal, state, or local governmental body related to your property, to operations on your property, or to releases from your property (including discharges to POTWs).

We found evidence of only 12 environmental citations. The majority of the WRC/MDNR's "Notices of Noncompliance" (NON) were issued for exceeding effluent limitations set forth in the Mill's NPDES Permit. In addition to the NONs for effluent exceedances, other NONs were issued, including a single PCB-related record keeping violation issued by the U.S. EPA. These NONs are identified and described in Table 11.

Question No. 37: PCB Sampling Data

To the extent not covered elsewhere in this questionnaire, please provide all PCB analytical data for sediments, soil, groundwater, and surface water at your property, or at any off-site facility described in Question 29. Please provide the concentration levels of PCBs for all sampling events collected on your property and during sampling events under your control. Please segregate data by media sampled, and list by sampling location and date. Please describe, reference (by document and relevant page numbers), and produce to the depository any documents with data relevant to answering this question that were not produced to the depository as part of your initial production. Please reference (by document and relevant page numbers) all documents in the depository that were relied on to answer this question.

Plainwell Mill Warehouse Construction Site

In October 1994, an investigation of the Mill warehouse construction site was conducted. Thirty-four soil samples were collected and analyzed for PCBs using an immunoassay test kit, and seven soil samples were submitted to Quanterra Environmental Services (Quanterra) for analysis of PCBs. Sampling occurred on October 6 and October 12, 1994.

- The results of the immunoassay tests indicated a PCB concentration of greater than one (>1) part per million (ppm) in 6 of the 34 soil samples (SPW-3, SPW-5, SPW-6, SPW-7, SWP-8, and SPW-9). Each of the PCB detections were in the soil layer of 0.0 to 0.5 feet below ground surface (bgs).

The analysis conducted by Quanterra detected PCBs in four of the seven soil samples.

- The 0.0 to 0.5 foot interval for SPW-1 had an estimated PCB concentration of 0.037 mg/kg, quantified as Aroclor 1254.
- The 2.0 to 2.5 foot interval for SPW-1 had estimated PCB concentrations of 0.061 mg/kg and 0.20 mg/kg, quantified as Aroclor 1248 and Aroclor 1254, respectively.
- The 4.5 to 5.0 foot interval for SPW-1 had estimated PCB concentrations of 0.023 mg/kg and 0.18 mg/kg, quantified as Aroclor 1248 and Aroclor 1254, respectively.
- The 0.0 to 0.5 foot interval for SPW-6 had a reported PCB concentration of 1.8 mg/kg, quantified as Aroclor 1254.

The results of the investigation discussed above are reported in Technical Memorandum 15 (BBL, 1996a). The sample locations are shown on Figure 11 (Attachment 26) of Technical Memorandum 15 (BBL, 1996a).

BBL (1996a) discusses the results of two additional samples taken during the remedial investigation. One sample was a solid sample (SPC-1) taken from the location of the former primary clarifier. The second sample was a soil sample (SPI-1) taken from a location where waste may have been temporarily stored. The date that each of the samples were collected is unknown.

- The 0.0 to 0.5 foot interval for SPC-1 had reported PCB concentrations of 0.51 mg/kg and 0.23 mg/kg, quantified as Aroclor 1254 and Aroclor 1260, respectively.
- The 3.0 to 3.5 foot interval for SPI-1 had reported PCB concentrations of 0.82 mg/kg and 0.61 mg/kg, quantified as Aroclor 1254 and Aroclor 1260, respectively.

The locations of SPC-1 and SPI-1 are shown on Figure 10 (Attachment 19) of Technical Memorandum 15 (BBL, 1996a).

On July 6, 1995, an investigation of the Mill Phase II warehouse construction site was conducted. Twelve soil samples were analyzed for PCBs using an immunoassay test kit, two soil samples were submitted to Quanterra for PCB analysis, and two concrete samples from the base of the former primary clarifier were submitted to Quanterra for PCB analysis.

The immunoassay test kits detected PCBs in two of the twelve soil samples.

- The 0.0 to 0.5 foot interval of SPW-22 indicated a PCB concentration of greater than 1 ppm. Note that the immunoassay test provides only a qualitative determination of whether PCBs are present above a certain concentration threshold.
- The 4.5 to 5.0 foot interval of SPW-23 indicated a PCB concentration of greater than 25 ppm. Note that the immunoassay test provides only a qualitative determination of whether PCBs are present above a certain concentration threshold.

The analysis conducted by Quanterra detected PCBs in two of the four samples submitted.

- The 0.0 to 0.5 foot interval of SPW-22 had a reported PCB concentration of 1.5 mg/kg, quantified as Aroclor 1254.
- The 4.5 to 5.0 foot interval of SPW-23 had a reported PCB concentration 1.3 mg/kg, quantified as Aroclor 1248.
- The two concrete samples submitted to Quanterra for PCB analysis, had a reported analytical result of non-detect.

The results of the investigation were reported in a letter to Scott Cornelius of the Michigan Department of Environmental Quality (MDEQ) from Mark Brown of BBL, dated October 5, 1995 (KB10600095-KB10600118). The locations for the soil and concrete samples are shown on Figure 1 of the BBL letter (KB10600100).

Storm Sewer Sampling

In June 1994, a solid sample was collected from the end of a former wastewater discharge pipe (sample SPC-2), and from a storm sewer manhole (sample SPD-1), as reported in Technical Memorandum 15 (BBL, 1996a).

- The manhole sediment sample (SPD-1) had reported PCB concentrations of 2.9 mg/kg and 0.99 mg/kg, quantified as Aroclor 1254 and Aroclor 1260, respectively.
- The former wastewater pipe sediment sample (SPC-1) had a reported PCB concentration of 240 mg/kg, quantified as Aroclor 1248.

The sample locations are shown on Figure 3 (Attachment 6) of Technical Memorandum 15 (BBL, 1996a).

In December 1995, sediments/residuals were removed from the storm sewer manhole (where SPD-1 previously was collected) and the former wastewater pipe (where SPC-1 was previously collected). Two samples of the removed sediments, one from the storm sewer manhole, and one from the former wastewater pipe, were submitted to Upstate Laboratories, Inc. (Syracuse, New York) for analysis of PCBs.

- The reported result for the removed sediment from the manhole was a PCB concentration of 2 mg/kg, quantified as Aroclor 1254.
- The reported result for the removed sediment from former wastewater pipe was a PCB concentration 92 mg/kg, quantifies as Aroclor 1248.

A follow-up sediment sample was collected from the manhole in October 1996, and submitted to Inchcape – Aquatec Laboratories (Colchester, Vermont) for analysis of PCBs.

- The follow-up manhole sediment sample had reported PCB concentrations of 5.4 mg/kg and 1.8 mg/kg, quantified as Aroclor 1254 and Aroclor 1260, respectively.

December 1995 sediment removal activities are documented in a letter to Mary Schafer of the MDEQ from Mark Brown of BBL, dated December 3, 1996 (063565 - 063601). The location of the storm sewer manhole and the former wastewater pipe are shown on Figure 1 of the December 3, 1996 BBL letter.

In November 1997, a storm sewer line (Outfall B) was cleaned by Blasland, Bouck & Lee Environmental Services (BBLES). **The source of the sediments cleaned from the storm sewer line is not known.** Four samples were collected for analysis, two composite samples of the removed sediments, one unfiltered flush water sample, and one filtered flush water sample. The sediment samples, and the filtered flush water sample were submitted to Western Michigan Environmental Services, Inc. (Holland, Michigan) for PCB analysis. The unfiltered flush water sample was submitted to KAR Laboratories (Kalamazoo, Michigan) for PCB analysis.

- The first sediment composite sample had reported PCB concentrations of 28.0 mg/kg and 9.2 mg/kg, quantified as Aroclor 1254 and Aroclor 1260, respectively.
- The second sediment composite sample had reported PCB concentrations of 26.0 mg/kg and 19.0 mg/kg, quantified as Aroclor 1254 and Aroclor 1260, respectively.
- The filtered flush water sample had a reported analytical result of non-detect for PCBs.
- The unfiltered flush water sample had a reported analytical result of 12 μg/kg and 12 μg/kg, quantified as Aroclor 1254 and Aroclor 1260, respectively.

The results discussed above were presented in a letter to Scott Cornelius of the MDEQ from Doug Cowin of BBL, dated July 16, 1998 (063602 - 063615).

Question No. 38: Groundwater Flow Direction

Please attach a figure delineating the groundwater flow direction on your property.

Due to the close proximity of the Mill property to the Kalamazoo River, it is believed that the general direction of groundwater flow is northeast towards the river. However, groundwater elevation data is not available to construct a groundwater flow map because there was never a need to install groundwater monitoring wells at the Mill property. Both the 1973 dewatering lagoon investigation conducted by Williams & Works (S20263) and the 1994 Mill Investigation Study conducted by BBL (1996a) concluded that no further investigation activities, including the installation of groundwater monitoring wells, were warranted for the dewatering lagoon area at the Mill.

Groundwater flow patterns at the 12th Street Landfill were established based on groundwater elevation data collected in August of 1995, by Geraghty & Miller (1996a). As shown on Figure 14, groundwater flow underlying the 12th Street Landfill is towards the Kalamazoo River to the east and towards the adjacent wetland area to the north.

Question No. 39: Depth to Groundwater

Please provide depth to groundwater at your property.

Depth to groundwater measurements taken at the Mill by Williams & Works (Grand Rapids, Michigan) in September of 1973 indicate that the depth to groundwater is approximately 1.5 feet below ground surface (S20275-S20277) at three monitoring locations located immediately adjacent to the Kalamazoo River (S20267). However, it should be noted that, because the ground surface elevation increases with increased distance from the river, the depth to groundwater will increase accordingly.

In Addendum I to the RI (Geraghty & Miller, 1996a), the depth to groundwater measurements are reported for the 12th Street Landfill for August 1995. Table 2 of the addendum indicates that the depth to groundwater was from 4.33 feet to 33.35 feet below ground surface at that time. The groundwater monitoring locations are shown on Figure 2 of the addendum. The groundwater table elevation relative to the ground surface elevation for the 12th Street Landfill property is shown on Figure 14.

Question No. 40: Remediation Activities

In addition to remedial activities discussed in Question 29 above, please provide information regarding any environmental response activities potentially involving PCBs or PCB-containing materials conducted on your property, or on the Kalamazoo River, its tributaries, or other abutting Property, at your direction or under your control. Please indicate when it was done, what was done, the location, the expenses incurred, the results, and, if it has not concluded, when the environmental response activity is expected to conclude.

We found no additional information regarding any environmental response activities potentially involving PCBs or PCB-containing materials not previously described in the response to Question No. 29.

Additional Information:

Question No. 41: Funding Information

Please indicate how much money, to date, has been:

a) **Paid on your behalf, or is owed by you, to the EPA, MDEQ or any other government or governmental unit related to the RI/FS, and/or to other oversight agencies; and**

b) **Spent on your behalf, or is owed by you, for investigation, remediation, and consultant/contract fees and costs in relation to the Kalamazoo River**

Superfund Site (not including attorney's fees and costs, and not including money paid or owned to any government or governmental agency).

In answering Question 41, please segregate all costs and expenses between those incurred in relation to the Operable Unit(s) related specifically to the Kalamazoo River, and those incurred in relation to other Operable Units (please specify).

a) Governmental Oversight Costs: $781,907.85.

From 1992 (MDNR Invoice #92-001, dated May 8, 1992, covering the period 12/28/90 through 1/28/92) to October 31, 2000 (MDEQ Invoice #180596), a total of $781,907.85 in oversight costs related to the Remedial Investigation / Feasibility Study (RI/FS) has been paid on behalf of the Plainwell Mill.

b)	Kalamazoo River:	$4,670,201.21
	12th Street Landfill Operable Unit:	$1,531,909.14
	Total:	$6,202,110.35

These figures cover the period January 1, 1991 through November 15, 2000.

CERTIFICATION OF ANSWERS TO REQUEST FOR INFORMATION

I certify that, although I do not have personal knowledge of the facts in question, responses to this Questionnaire were based upon documents and available information, and that, to the best of my knowledge, information and belief, the submitted information is true, accurate, and complete, and that all documents submitted herewith are complete and authentic unless otherwise indicated. I certify that I am authorized to sign this document on behalf of _________.

____
NAME (print or type)

TITLE (print or type) ______________________________

SIGNATURE ______________________________

Sworn to before me this_____

day of ____________, 2001

____
Notary Public

Table 1. Historical Wastewater Data Summary for Outfall 005.

Year/Month	Discharge (mgd)	Influent BOD (lbs/day)	Effluent BOD (lbs/day)	Influent TSS (lbs/day)	Effluent TSS (lbs/day)	Influent TDS (lbs/day)	Effluent TDS (lbs/day)	Influent TVS (lbs/day)	Effluent TVS (lbs/day)	Influent PCB (ug/l)	Effluent PCB (ug/l)	Source
1955												
--	**1.37**	**---**	**3,722**	**---**	**14,645**	**---**	**---**	**---**	**---**	**---**	**---**	**066274**
Jul28-Aug3 [1]	1.24	5,720 [8]	5,330	29,080 [8]	23,402	---	---	12,813 [8]	10,763	---	---	064063-064064
1956												
Jan10-16 [1]	1.37	5,700 [8]	3,722	34,976 [8]	14,646	---	---	15,791 [8]	6,835	---	---	064059-064060
1957												
May	2.82 [2]	10,354 [8]	6,820 [2]	57,890 [8]	15,757 [2]	---	---	25,180 [8]	7,056	---	---	S22085; 064056
May	2.78 [2]	13,919 [8]	9,042 [2]	60,317 [8]	24,112 [2]	---	---	24,823 [8]	10,665	---	---	S22085; 064056
Dec	2.08 [2]	---	1,006 [2]	---	1,249 [2]	---	---	---	347 [2]	---	---	S24497
Dec	1.66 [2]	---	3,046 [2]	---	4,646 [2]	---	---	---	1,038 [2]	---	---	S24497
1959												
Aug	2.76 [2]	11,499 [8]	7,816 [2]	92,455 [8]	12,873 [2]	---	---	41,397 [8]	4,368 [2]	---	---	S24496; 064048-064049
Aug	2.85 [2]	10,924 [8]	6,645 [2]	64,837 [8]	13,290 [2]	---	---	28,500 [8]	4,034 [2]	---	---	S24496; 064048-064049
1960												
Jun - Sep [4]	1.96 [4]	---	---	39,687 [3,4]	10,948 [3,4]	---	---	---	---	---	---	S24503
Jul	1.98	---	---	---	---	---	---	---	---	---	---	S24506
Aug	2.00	5,223 [3]	763 [3]	---	---	---	---	---	---	---	---	S24502; S24505; S24506
Sep	2.06	5,796 [3]	415 [3]	---	---	---	---	---	---	---	---	S24501; S24502; S24504; S24505
Oct [14]	**---**	**704 (ppm)**	**344 (ppm)**	**2,984 (ppm)**	**688 (ppm)**	**---**	**---**	**---**	**---**	**---**	**---**	**S24485**
1961												
Jun	2.56 [2]	---	4,260 [2]	---	5,370 [2]	---	---	---	1,950 [2]	---	---	KJ00800078
1964												
Sep	1.40	---	3,010	8,020	769	---	---	2,960	291	---	---	S19726
Oct	1.32	---	2,515	5,414	2,014	---	---	2,539	990	---	---	S19726; S19727
Nov	1.12	---	2,919	5,405	499	---	---	2,479	250	---	---	S19727-S19729
Dec	1.26	2,939	2,191	5,333	482	---	---	2,309	227	---	---	S19729-S19731
1965												
Jan	0.78	---	---	4,069	354	---	---	1,641	164	---	---	S19533; S19731-S19732
Feb	1.37	---	2,902	6,321	718	---	---	2,427	272	---	---	S19533; S19732-19734
Mar	1.32	---	3,498	9,286	1,230	---	---	3,051	481	---	---	S19533; S19734
Apr	---	---	---	---	---	---	---	---	---	---	---	S19533
May	1.75	---	3,667	20,042	1,000	---	---	6,843	332	---	---	S19723-S19724; S19533
Jun	1.32	---	---	12,933	1,396	---	---	4,150	386	---	---	S19533; S19723
Jul	---	3,692	2,217	---	---	---	---	---	---	---	---	S19533; S19735-S19736
Aug	1.11	2,870	1,814	3,129	---	---	---	---	---	---	---	S19736-S19739; S19533
Sep	1.41	4,507	3,061	15,525	---	---	---	---	---	---	---	S19739-S19742; S19533
Oct	1.35	3,797	2,705	---	---	---	---	---	---	---	---	S19742-S19743; S19533
Nov	---	2,604	1,735	---	---	---	---	---	---	---	---	S19533
Dec	---	3,229	2,357	---	---	---	---	---	---	---	---	S19533
1966												

Table 1. Historical Wastewater Data Summary for Outfall 005.

Year/Month	Discharge (mgd)	Influent BOD (lbs/day)	Effluent BOD (lbs/day)	Influent TSS (lbs/day)	Effluent TSS (lbs/day)	Influent TDS (lbs/day)	Effluent TDS (lbs/day)	Influent TVS (lbs/day)	Effluent TVS (lbs/day)	Influent PCB (ug/l)	Effluent PCB (ug/l)	Source
(1966) Jan	---	5,374	4,005	---	---	---	---	---	---	---	---	S19533
Mar	1.55	5,548	4,196	---	---	---	---	---	---	---	---	S24705
Apr	1.44	5,393	3,953	---	---	---	---	---	---	---	---	S24700; S24701
May	2.27	5,943	4,480	---	---	---	---	---	---	---	---	S24702; S24703
1968												
Feb	1.47 [9]	5,522 [9]	1,919 [9]	15,444 [9]	1,479 [9]	---	---	8,883 [9]	604 [9]	---	---	S20136
May	1.45 [2]	---	267 [2,8]	---	630 [2,8]	---	---	---	389 [2,8]	---	---	066403-066405
May	1.71 [2]	---	385 [2,8]	---	798 [2,8]	---	---	---	570 [2,8]	---	---	066403-066405
Sep	1.42	3,486	551	8,691	516	---	---	4,876	432	---	---	KS01500023-KS01500025
Oct	1.66	3,866	719	7,801	755	---	---	4,627	603	---	---	KS01500383-KS01500385
Nov	1.66	2,248	1,263	6,292	1,796	---	---	3,103	---	---	---	KS01500388; KS01500389; KS01500392
Dec	1.41	2,929	1,387	6,280	1,125	---	---	2,169	535	---	---	KS01500393; KS01500601; KS01500602
1969	---	---	998 [13]	---	---	---	---	---	---	---	---	S18944
1970												
Jan	1.61	---	913	---	1,106	---	---	---	---	---	---	S13781 - S13785
Feb	1.51	---	970	---	965	---	---	---	---	---	---	S13777 - S13781
Mar	1.54	---	850	---	725	---	---	---	---	---	---	S13772 - S13777
Apr	1.61	---	924	---	684	---	---	---	---	---	---	S13768 - S13772
May	1.50	---	985	---	677	---	---	---	---	---	---	S13764 - S13768
Jun	1.66	---	926	---	943	---	---	---	---	---	---	S13759 - S13763
Jul	1.79	---	807	---	837	---	---	---	---	---	---	S13755 - S13759
1971												
Jan	1.02	---	1,020	---	613	---	---	---	---	---	<100 ppt [5]	S15137; S00044
Feb	1.04	---	944	---	505	---	---	---	---	---	---	S15137
Mar	1.22	---	682	---	458	---	---	---	---	---	---	S15138
Apr	1.34	---	1,087	---	490	---	---	---	---	---	---	S15138
May	1.71	---	1,321	---	795	---	---	---	---	---	---	S15139
Jun	1.57	---	1,154	---	749	---	---	---	---	---	---	S15139
Jul	1.35	---	724	---	763	---	---	---	---	---	---	S15140
Aug	1.42	---	885	---	595	---	---	---	---	---	---	S15140
Sep	1.36	---	1,018	---	901	---	---	---	---	---	---	S15141
Oct	1.63	---	615	---	841	---	---	---	---	---	---	S15141
Nov	1.69	---	652	---	761	---	---	---	---	---	---	S15142
Dec	1.52	---	685	---	711	---	---	---	---	---	---	S15142
1972												
Apr	---	---	1,211	---	1,335	---	---	---	---	---	---	S18949
	1.44 [10]	---	1,229 [10]	---	1,266 [10]	---	---	---	---	---	---	S18932
May	1.70	---	1,211	---	1,335	---	---	---	---	---	---	S16865-S16866
Jun	---	---	1,353	---	801	---	---	---	---	---	---	S16903
Sep	---	---	1,069	---	930	---	---	---	---	---	---	S16878
Oct	---	---	1,295	---	---	---	---	---	---	---	---	S16874
Nov	1.70	---	1,069	---	987	---	---	---	---	---	---	S16882

Table 1. Historical Wastewater Data Summary for Outfall 005.

Year/Month	Discharge (mgd)	Influent BOD (lbs/day)	Effluent BOD (lbs/day)	Influent TSS (lbs/day)	Effluent TSS (lbs/day)	Influent TDS (lbs/day)	Effluent TDS (lbs/day)	Influent TVS (lbs/day)	Effluent TVS (lbs/day)	Influent PCB (ug/l)	Effluent PCB (ug/l)	Source
1973												
April	2.79 [2]	---	1,630 [2]	---	790 [2]	---	12,330 [2]	---	4,650 [2]	---	0.13 ppb [2]	KS01400001; KS01400004
	2.28 [2]	---	969 [2]	---	399 [2]	---	9,780 [2]	---	2,730 [2]	---	0.13 ppb [2]	KS01400001; KS01400004
Jun	**---**	**---**	**1,379**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**S16890**
Aug	1.76	3,595	1,174	13,630	620	---	---	6,262	438	---		S20154; S20186
Oct	**1.98 [12]**	**---**	**1,954 [11]**	**---**	**1,612 [11]**	**---**	**---**	**---**	**---**	**---**	**---**	**S20502-S20504**
1974												
Jan	1.91	3,536	1,483	13,348	1,293	---	---	5,703	796	---	---	KS01500041; KS01500042; KS01500044
Feb	1.96	3,030	1,239	10,696	1,038	---	---	5,029	819	---	---	KS01500046; KS01500048
Mar	2.06	3,311	1,444	13,175	805	---	---	6,776	600	---	---	KS01500050; KS01500052
Apr	1.82	2,926	1,410	12,039	633	---	---	5,534	546	---	---	KS01500054; KS01500056
May	2.05	2,978	1,246	11,962	731	---	---	6,726	513	---	---	KS01500058; KS01500060
Jun	1.75	2,810	1,387	9,494	785	---	---	4,470	612	---	---	KS01500062; KS01500064
Jul	2.11	---	1,672	---	988	---	---	---	---	---	---	KS01500039
Aug	2.28	---	1,343	---	672	---	---	---	---	---	---	KS01500032
Sep	2.01	---	1,394	---	551	---	---	---	---	---	---	KS01500037
Oct	2.02	2,929 [8]	1,320	12,540 [8]	750	---	---	6,531 [8]	707 [8]	---	---	KS01600199; KS01600201
Nov	1.65	2,192 [8]	1,177	8,423 [8]	1,140	---	---	4,370 [8]	786 [8]	---	---	KS01600202; KS01600204
Dec	1.25	1,310	484	5,587	1,432	---	---	2,839 [8]	333 [8]	---	---	KS01600189; KS01600191
1975												
Jan	1.51	2,456	914	7,455	842	---	---	4,413	718	---	---	KS01500019; KS01500020
Feb	1.59	2,497	1,020	7,742	675	---	---	5,196	747	---	---	KS01500998; KS01501000
Mar	1.64	3,294	1,619	8,213	842	---	---	5,390	671	---	---	KS01501002; KS01501005
Apr	1.55	3,199	1,044	10,148	990	---	---	7,338	891	---	---	KS01501006; KS01501007; KS01501009
May	1.45	2,785	9,430	9,959	1,007	---	---	5,160	793	---		KS01501010-KS01501013
	1.57 [2]	---	880 [2]	---	1,590 [2]	---	7,790 [2]	---	3,970 [2]	---	<0.01 [2]	S21003
Jun	1.39	2,614	570	8,957	846	---	---	6,729	730	---	---	KS01501014-KS01501016
Jul	1.56	2,400	598	8,242	566	---	---	5,431	532	---	---	KS01501018; KS01501021
Aug	1.14	2,635	730	8,101	589	---	---	4,694	362	---	---	KS01501022; KS01501024
Sep	1.39	4,131	1,351	8,316	934	---	---	5,759	780	---	---	KS01501026; KS01501029
Oct	1.37	3,242	1,134	8,783	679	---	---	5,657	492	---	---	KS01501031; KS01501032
Nov	**1.25**	**3,439**	**973**	**11,230**	**888**							**064779-064783**
1976												
Jan	1.40	2,552	987	7,737	758	---	---	3,779	571	---	---	S20076; KS01500950; KS01500952
Feb	1.41	2,382	901	9,071	681	---	---	4,157	517	---	---	S20076; KS01500954; KS01500956; KS01500957
Mar	1.46	2,126	622	8,139	420	---	---	4,725	355	---	---	S20076; KS01500958-KS01500961
Apr	1.54	1,971	652	11,327	414	---	---	5,722	308	---	---	S20076; KS01500962-KS01500964
May	1.64	2,878	723	12,293	605	---	---	5,813	477	---	---	S20076; KS01500966-KS01500968
Jun	1.77	2,610	615	15,670	410	---	---	7,900	325	---	---	S20076; KS01500971; KS01500972
Jul	1.66	2,619	737	13,881	333	---	---	6,511	263	---	---	S20076; KS01500974-KS01500976
Aug	1.66	3,555	764	15,597	660	---	---	9,638	400	---		S20076; KS01500979; KS01500980

Table 1. *Historical Wastewater Data Summary for Outfall 005.*

Year/Month	Discharge (mgd)	Influent BOD (lbs/day)	Effluent BOD (lbs/day)	Influent TSS (lbs/day)	Effluent TSS (lbs/day)	Influent TDS (lbs/day)	Effluent TDS (lbs/day)	Influent TVS (lbs/day)	Effluent TVS (lbs/day)	Influent PCB (ug/l)	Effluent PCB (ug/l)	Source
(1976) Aug	2.42 [2]	---	1,000 [2]	---	1,100 [2]	---	11,400 [2]	---	---	---	<0.1 [2]	S21044
	2.14 [6]	---	947 [6]	---	1,393 [6]	---	---	---	---	---	---	S21044
	2.53 [6]	---	655 [6]	---	1,309 [6]	---	---	---	---	---	---	S21044
Sep	1.76	2,328	801	11,125	783	---	---	7,634	719	---	---	S20076; KS01500982; KS01500983
Oct	1.66	3,491	1,060	11,719	951	---	---	8,855	733	---	---	S20076; KS01500987; KS01500988
Nov	1.68	2,978	940	7,355	705	---	---	5,670	631	---	---	S20076; KS01500991; KS01500992
Dec	1.68	1,818	778	7,119	946	---	---	5,367	931	---	---	S20076; KS01500994; KS01500996
1977												
Jan	1.75	2,548	789	8,340	880	---	---	---	---	---	---	KS01500028; KS01500029; KS01500948
Feb	1.80	2,975	839	9,570	1,049	---	---	6,706	---	---	---	KS01500613; KS01500614
Mar	1.83	3,375	799	19,147	1,015	---	---	11,474	---	---	---	KS01500615; KS01500616
Apr	2.01	---	829	---	900	---	---	---	---	---	---	KS01500617; KS01500618
May	1.81	2,633	810	16,011	901	---	---	11,156	---	---	---	KS01500619; KS01500620; KS01500238
Jun	1.72	2,641	763	7,287	928	---	---	4,540	---	---	---	KS01500621; KS01500622; KS01500255
Jul	1.96	2,302	811	13,169	862	---	---	7,821	---	---	---	KS01500623; KS01500624
Aug	2.56	2,354	820	18,244	1,064	---	---	10,871	---	---	---	KS01500625; KS01500626
Sep	2.55	2,918	828	34,034	835	---	---	18,194	---	---	---	KS01500627; KS01500628
Oct	2.43	2,710	876	22,637	654	---	---	11,932	---	---	---	KS01500629; KS01500630
Nov	2.73	2,539	911	35,100	1,179	---	---	19,965	---	---	---	KS01500631; KS01500632
Dec	2.72	---	848	---	1,120	---	---	---	---	---	---	KS01500633; KS01500634; KS01500923
1978												
Jan	2.57	---	688	30,661	1,054	---	---	---	---	---	---	KS01500635; KS01500636; KS01500889
Feb	2.77	---	957	---	934	---	---	---	---	---	---	KS01500637; KS01500638; KS01500891
Mar	2.77	2,877	770	27,246	930	---	---	12,840	---	---	---	KS01500639; KS01500640; KS01500893
Apr	2.77	2,201	674	30,139	818	---	---	13,623	---	---	---	KS01500641; KS01500642; KS01500898
May	2.78	2,115	604	24,779	792	---	---	13,525	---	---	---	KS01500643; KS01500644; KS01500899
Jun	2.83	1,991	687	25,387	898	---	---	11,944	---	---	---	KS01500645; KS01500646; KS01500902
Jul	2.91	3,018	823	20,024	700	---	---	---	---	---		KS01500647; KS01500648; KS01500905
	3.06 [2]	---	2,426 [2]	---	1,323 [2]	---	17,199 [2]	---	---	---	0.1 [2]	S21253
	3.06 [7]	---	2,811 [7]	---	1,482 [7]	---	17,378 [7]	---	---	---		S21254
	3.06 [7]	---	3,067 [7]	---	1,227 [7]	---	18,144 [7]	---	---	---		S21254
Aug	2.89	4,313	1,119	15,808	745	---	---	---	---	---	---	KS01500649; KS01500650; KS01500908
Sep	2.81	3,904	1,006	26,077	694	---	---	---	---	---	---	KS01500651; KS01500652; KS01500911
Oct	2.84	3,815	941	19,640	628	---	---	---	---	---	---	KS01500653; KS01500654; KS01500914
Nov	2.69	4,204	822	22,510	634	---	---	---	---	---	---	KS01500655; KS01500656; KS01500917
Dec	2.30	3,542	767	24,961	1,068	---	---	---	---	---	---	KS01500657; KS01500658; KS01500922
1979												
Jan	2.46	4,549	791	38,444	1,051	---	---	---	1,027	---	---	KS01500788-KS01500790
Feb	2.44	3,634	1,047	35,331	1,193	---	---	---	1,139	---	---	KS01500793-KS01500795
Mar	2.38	3,116	702	43,502	923	---	---	---	905	---	---	KS01500016; KS01500798; KS01500799
Apr	2.37	3,228	681	23,004	1,224	---	---	---	1,102	---	---	KS01500802-KS01500804

Table 1. Historical Wastewater Data Summary for Outfall 005.

Year/Month	Discharge (mgd)	Influent BOD (lbs/day)	Effluent BOD (lbs/day)	Influent TSS (lbs/day)	Effluent TSS (lbs/day)	Influent TDS (lbs/day)	Effluent TDS (lbs/day)	Influent TVS (lbs/day)	Effluent TVS (lbs/day)	Influent PCB (ug/l)	Effluent PCB (ug/l)	Source
(1979) May	2.46	4,175	828	24,709	1,001	---	---	---	922	---	---	KS01500807-KS01500809
Jun	2.45	3,997	865	22,100	757	---	---	---	691	---	---	KS01500780-KS01500782
Jul	2.51	3,975	894	27,980	909	---	---	---	820	---	---	KS01500784-KS01500786
Aug	2.64	4,079	769	24,806	853	---	---	---	823	---	---	KS01500811-KS01500813
Sep	2.11	3,352	713	20,291	973	---	---	---	872	---	<0.1 [5]	KS01500815-KS01500817; S18463
Oct	2.61	4,402	873	28,594	945	---	---	---	908	---	---	KS01500819-KS01500821
Nov	2.47	4,269	884	33,177	909	---	---	---	878	---	---	KS01500823-KS01500825
Dec	2.44	3,842	912	19,075	742	---	---	---	737	---	---	KS01500827-KS01500829
1980												
Jan	2.55	3,582	859	19,961	982	---	---	---	943	---	---	KS01500776; KS01500831-KS01500834
Feb	2.48	3,697	985	17,868	1,114	---	---	---	1,083	---	---	KS01500776; KS01500835-KS01500837
Mar	2.40	3,987	1,057	20,093	999	---	---	---	983	---	---	KS01500776; KS01500839-KS01500841
Apr	2.48	3,798	1,016	25,863	969	---	---	---	954	---	---	KS01500776; KS01500843-KS01500845
May	2.58	3,764	980	22,982	1,177	---	---	---	1,140	---	---	KS01500776; KS01500847-KS01500849
Jun	2.48	3,942	1,023	29,451	1,134	---	---	---	1,035	---	---	KS01500776; KS01500851-KS01500853
	2.72 [2]	---	551 [2]	---	4,851 [2]	---	13,230 [2]					066696
Jul	2.39	3,075	885	24,241	875	---	---	---	871	---	---	KS01500776; KS01500855-KS01500857
Aug	2.42	2,993	702	26,467	969	---	---	---	884	---	---	KS01500859-KS01500861
Sep	2.13	3,009	832	8,110	498	---	---	---	490	---	---	KS01500863-KS01500865
Oct	1.85	3,225	735	6,723	418	---	---	---	418	---	---	KS01500867-KS01500869
Nov	1.93	3,021	839	5,180	377	---	---	---	374	---	---	KS01500871-KS01500873
Dec	2.40	4,060	1,015	15,802	681	---	---	---	678	---	---	KS01500875-KS01500877
1981												
Jan	2.42	3,919	921	17,160	1,077	---	---	---	1,049	---	---	KS01500699-KS01500701
Feb	2.53	3,404	1,110	18,945	837	---	---	---	820	---	---	KS01500703-KS01500705
Mar	2.57	3,590	945	20,787	914	---	---	---	875	---	---	KS01500880-KS01500882
Apr	2.70	3,297	1,015	28,349	1,202	---	---	---	1,144	---	---	KS01500884-KS01500886
May	2.64	2,952	859	24,703	1,284	---	---	---	1,247	---	---	KS01500659-KS01500661
Jun	2.83	3,062	814	22,979	1,127	---	---	---	1,052	---	---	KS01500662; KS01500664; KS01500665
Jul	2.73	3,946	915	25,091	886	---	---	---	880	---	---	KS01500666; KS01500668; KS01500669
Aug	2.79	4,365	1,043	30,040	1,024	---	---	---	1,024	---	---	KS01500670; KS01500671; KS01500673
Sep	2.58	---	1,433	25,433	936	---	---	---	936	---	---	KS01500674; KS01500675; KS01500677
Oct	2.61	---	2,329	29,205	1,874	---	---	---	1,798	---	---	KS01500678; KS01500679; KS01500681
Nov	2.62	13,376	1,616	28,899	1,965	---	---	---	1,902	---	---	KS01500682; KS01500684; KS01500685
Dec	2.58	10,027	1,775	38,015	2,083	---	---	---	1,826	---	---	KS01500686; KS01500687; KS01500688
1982												
Jan	2.71	14,183	1,949	60,768	2,641	---	---	---	2,115	---	---	KS01500768-KS01500770
Feb	2.95	12,593	2,550	50,576	2,974	---	---	---	2,241	---	---	KS01500747; KS01500765; KS01500766
Mar	2.59	9,054	1,673	24,761	2,447	---	---	---	1,903	---	---	KS01500744; KS01500746; KS01500748
Apr	2.67	7,511	1,721	26,286	2,754	---	---	---	2,194	---	---	KS01500737-KS01500739
May	2.80	11,283	1,891	33,382	2,999	---	---	---	2,367	---	---	KS01500773-KS01500775
Jun	2.94	11,833	2,220	31,347	3,205	---	---	---	2,445	---	---	KS01500741-KS01500743

Table 1. Historical Wastewater Data Summary for Outfall 005.

Year/Month	Discharge (mgd)	Influent BOD (lbs/day)	Effluent BOD (lbs/day)	Influent TSS (lbs/day)	Effluent TSS (lbs/day)	Influent TDS (lbs/day)	Effluent TDS (lbs/day)	Influent TVS (lbs/day)	Effluent TVS (lbs/day)	Influent PCB (ug/l)	Effluent PCB (ug/l)	Source
(1982) Jul	3.10	12,375	2,017	31,989	4,510	---	---	---	2,876	---	---	KS01500750-KS01500752
Aug	3.11	11,348	2,535	29,509	4,442	---	---	---	3,249	---	---	KS01500753-KS01500755
Sep	2.78	14,189	2,305	38,554	3,962	---	---	---	2,740	---	---	KS01500756-KS01500758
Oct	2.80	15,696	2,589	39,160	4,100	---	---	---	3,252	---	---	KS01500777-KS01500779
	3.17[2]	---	---	---	2,170[2]	---	20,903[2]	---	---	---	---	S21555
Nov	2.95	12,999	2,478	34,164	4,790	---	---	---	3,496	---	---	KS01500759-KS01500761
Dec	3.00	---	2,982	28,977	3,712	---	---	---	2,927	---	---	KS01500762-KS01500764
1983												
Jan	2.93	10,121	3,018	24,180	3,881	---	---	---	2,947	---	---	KS01500734-KS01500736
Feb	3.08	13,656	2,854	30,663	3,486	---	---	---	2,603	---	---	KS01500692-KS01500694
Mar	2.97	13,675	3,626	31,529	4,659	---	---	---	3,579	---	---	KS01500695-KS01500697
Apr	3.09	9,838	3,118	37,175	4,334	---	---	---	3,402	---	---	KS01500719-KS01500721
May	2.82	7,636	2,100	21,705	4,320	---	---	---	3,191	---	---	KS01500716-KS01500718
Jun	3.24	10,932	2,890	33,863	6,117	---	---	---	3,817	---	---	KS01500706-KS01500708
Jul	3.06	7,443	2,867	36,719	4,481	---	---	---	3,472	---	---	KS01500710-KS01500712
Aug	3.19	5,493	2,894	30,680	3,697	---	---	---	2,887	---	---	KS01500725-KS01500727
Sep	3.02	6,073	1,785	21,512	3,565	---	---	---	3,013	---	---	KS01500728-KS01500730
Oct	2.91	8,177	2,611	26,141	4,790	---	---	---	3,692	---	---	KS01500731-KS01500733
Nov	2.77	6,331	1,693	26,630	3,702	---	---	---	2,937	---	---	KS01500713-KS01500715
Dec	2.80	6,958	2,443	28,368	6,332	---	---	---	4,867	---	---	KS01500722-KS01500724
1984												
Jan	3.11	5,984	1,960	22,825	3,418	---	---	---	2,793	---	---	KS01500690-KS01500692
Feb	3.14	---	1,379	---	1,984	---	---	---	---	---	---	S13592
Mar	3.22	---	176	---	434	---	---	---	---	---	---	066458
Apr	3.17	---	202	---	782	---	---	---	---	---	---	S13619
May	3.31	---	156	---	454	---	---	---	---	---	---	S13642
Jun	3.20	---	265	---	503	---	---	---	---	---	---	S13538
Jul	3.06	---	---	---	---	---	---	---	---	---	---	KS01600056-KS01600057
Aug	2.76	---	214	---	397	---	---	---	---	---	---	S13608
Sep	2.58	---	161	---	258	---	---	---	---	---	---	S13604
Oct	2.68	---	153	---	496	---	---	---	---	---	---	S13580
Nov	2.43	---	189	---	508	---	---	---	---	---	---	S13632
Dec	2.60	---	289	---	473	---	---	---	---	---	---	S13634
1985												
Jan	2.64	---	---	16,943	462	---	---	10,657	397	---		S21551
	2.64[2]	---	353[2]	---	595[2]	---	16,317[2]	---	---	---	<0.1[2]	S21551
	2.64[7]	---	264[7]	---	639[7]	---	15,864[7]	---	---	---		S21552
Jan	2.64[7]	---	143[7]	---	661[7]	---	15,423[7]	---	---	---		S21552
	2.64	---	301	---	460	---	---	---	---	---	---	S13526
Feb	2.67	---	201		463	---	---	---	---	---	---	S14520
Mar	2.72	---	280	---	616	---	---	---	---	---	---	S13566
Apr	2.74	---	260	---	327	---	---	---	---	---	---	S13560

Table 1. Historical Wastewater Data Summary for Outfall 005.

Year/Month	Discharge (mgd)	Influent BOD (lbs/day)	Effluent BOD (lbs/day)	Influent TSS (lbs/day)	Effluent TSS (lbs/day)	Influent TDS (lbs/day)	Effluent TDS (lbs/day)	Influent TVS (lbs/day)	Effluent TVS (lbs/day)	Influent PCB (ug/l)	Effluent PCB (ug/l)	Source
(1985) May	2.63	---	381	---	427	---	---	---	---	---	---	S13623
Jun	2.65	---	618	---	506	---	---	---	---	---	---	S13552
Jul	2.20	---	---	23,636	222	---	---	9,314	188	---	---	059569-059597
Jul	2.45	---	219	---	242	---	---	---	---	---	---	S13556
Aug	2.44	---	---	---	---	---	---	---	---	---	<0.01 [5]	KB50403025;KS01600045-KS01600046
Aug	2.36	---	249	---	484	---	---	---	---	---	---	S13520
Sep	2.49	---	---	---	---	---	---	---	---	---	0.039 [5]	KB50403025;KS01600046-KS01600047
Sep	2.36	---	258	---	354	---	---	---	---	---	---	S13486
Oct	2.38	---	208	---	246	---	---	---	---	---	---	S13544
Nov	2.67	---	323	---	504	---	---	---	---	---	---	S13468
Dec	2.63	---	262	---	355	---	---	---	---	---	---	S16220; S16223
1986												
Jan	2.31	8,634	194	---	---	---	---	---	---	---	---	059598-059628
	2.39	---	201	---	412	---	---	---	---	---	---	S13576
Feb	2.31	8,536	216	25,294	445	---	---	14,489	366	---	---	059629-059657; 060757-060785
Mar	2.46	10,064	383	24,900	613	---	---	12,600	427	---	---	060786-060849
Apr	2.43	10,916	205	23,334	392	---	---	13,009	216	---	---	061367-061397; 061430-061460
May	2.36	7,568	243	---	600	---	---	---	---	---	---	061398-061429; **S13496**
Jun	2.28	9,947	161	---	311	---	---	---	---	---	---	060510-060540; **S13514**
Jul	2.40	---	160	---	422	---	---	---	---	---	---	S13492
Aug	2.26	---	187	---	331	---	---	---	---	---	---	S13644
Sep	2.34	---	159	---	252	---	---	---	---	---	---	S13474
Oct	2.43	---	152	---	330	---	---	---	---	---	---	S13429
Nov	2.44	---	194	---	669	---	---	---	---	---	---	S13478
Dec	2.67	---	---	---	---	---	---	---	---	---	---	KS01600033
1987												
Jan	2.42	---	348	---	---	---	---	---	---	---	---	S18003
Feb	2.46	---	213	---	414	---	---	---	---	---	---	S13443
Mar	2.25	---	438	---	660	---	---	---	---	---	---	S13433
Apr	2.34	---	487	---	582	---	---	---	---	---	---	S13437-S13438
May	2.15	---	311	---	535	---	---	---	---	---	---	S13439
Jun	2.27	---	485	---	610	---	---	---	---	---	---	S13445
Jul	2.31	---	220	---	249	---	---	---	---	---	---	S13379
Aug	2.64	---	188	---	416	---	---	---	---	---	---	S13369
Sep	2.78	---	164	---	296	---	---	---	---	---	---	S13360
Oct	2.61	---	153	---	387	---	---	---	---	---	---	S13362-S13363
Nov	2.55	---	202	---	329	---	---	---	---	---	---	S13357-S13358
Dec	2.52	---	157	---	266	---	---	---	---	---	---	S13351-S13352
1988												
Jan	2.69	---	187	40,390	400	---	---	32,444	350	---	---	060541-060571; 063404
Feb	2.93	---	536	---	509	---	---	---	---	---	---	060604-060633; 063406
Mar	2.47	---	397	17,408	522	---	---	10,724	406	---	---	060572-060603; 063408
Apr	2.49	---	364	---	320	---	---	---	---	---	---	063411

Table 1. Historical Wastewater Data Summary for Outfall 005.

Year/Month	Discharge (mgd)	Influent BOD (lbs/day)	Effluent BOD (lbs/day)	Influent TSS (lbs/day)	Effluent TSS (lbs/day)	Influent TDS (lbs/day)	Effluent TDS (lbs/day)	Influent TVS (lbs/day)	Effluent TVS (lbs/day)	Influent PCB (ug/l)	Effluent PCB (ug/l)	Source
(1988) Apr	2.5 [2]	---	---	---	229 [2]	---	19,391 [2]	---	---	---	<0.05 [5]	S13303; S13306
	2.5 [7]	---	---	---	230 [7]	---	---	---	---	---	<0.05 [7]	S13304; S13306
	2.5 [7]	---	---	---	209 [7]	---	---	---	---	---	---	S13304
	2.5 [7]	---	---	---	209 [7]	---	---	---	---	---	---	S13304
May	2.63	---	377	22,265	360	---	---	9,552	320	---	---	059537-059568; 063413
Jun	2.77	---	505	---	469	---	---	---	---	---	---	063415
Jul	2.82	---	805	---	724	---	---	---	---	---	---	063417
Aug	2.76	---	531	---	339	---	---	---	---	---	---	063419
Sep	2.60	---	445	---	414	---	---	---	---	---	---	063421
Oct	2.37	---	276	---	369	---	---	---	---	---	---	063423
Nov	2.48	---	265	---	357	---	---	---	---	---	---	063425
Dec	2.71	---	316	---	300	---	---	---	---	---	---	063427
1989												
Jan	2.26	---	140	---	192	---	---	---	---	---	---	S14486
Feb	2.33	---	175	---	150	---	---	---	---	---	---	S14517
Apr	2.43	---	117	---	256	---	---	---	---	---	---	S14513
May	2.55	---	175	---	359	---	---	---	---	---	---	S14507
Jun	2.38	---	198	---	339	---	---	---	---	---	---	S14491
Jul	2.48	---	351	---	532	---	---	---	---	---	---	S14510
Aug	2.47	---	326	---	367	---	---	---	---	---	---	S14502
Sep	2.62	---	253	---	448	---	---	---	---	---	---	S14498
Oct	2.63	---	277	---	610	---	---	---	---	---	---	S14499
Nov	2.50	---	187	---	504	---	---	---	---	---	---	S14490
Dec	2.48	---	177	---	576	---	---	---	---	---	---	S14484
1990												
Jan	2.66	---	289	---	482	---	---	---	---	---	---	S14474
Feb	2.42	---	166	---	309	---	---	---	---	---	---	S14482
Mar	2.30	---	239	---	567	---	---	---	---	---	---	S14476
Apr	2.24	---	253	---	316	---	---	---	---	---	---	S14429
May	2.26	---	166	---	254	---	---	---	---	---	---	S14420
Jun	2.32	---	174	---	284	---	---	---	---	---	---	S14460
Jul	2.65	---	301	---	308	---	---	---	---	---	---	S14480
Aug	2.65	---	359	---	432	---	---	---	---	---	---	S14470
	2.6 [2]	---	108 [2]	---	217 [2]	---	---	---	---	---	---	S13158
	2.6 [7]	---	108 [7]	---	195 [7]	---	---	---	---	---	---	S13159
	2.6 [7]	---	65 [7]	---	130 [7]	---	---	---	---	---	---	S13159
Sep	2.62	---	235	---	294	---	---	---	---	---	---	S14449
Oct	2.70	---	222	---	253	---	---	---	---	---	---	S14433
Nov	2.67	---	354	---	332	---	---	---	---	---	---	S14438
Dec	2.83	---	362	---	273	---	---	---	---	---	---	S14431
1994												

Table 1. Historical Wastewater Data Summary for Outfall 005.

Year/Month	Discharge (mgd)	Influent BOD (lbs/day)	Effluent BOD (lbs/day)	Influent TSS (lbs/day)	Effluent TSS (lbs/day)	Influent TDS (lbs/day)	Effluent TDS (lbs/day)	Influent TVS (lbs/day)	Effluent TVS (lbs/day)	Influent PCB (ug/l)	Effluent PCB (ug/l)	Source
(1994) Jan	2.81	8,119	92	30,769	314	---	---	---	---	---	---	S17072
Feb	2.84	8,463	85	34,528	602	---	---	---	---	---	---	S17077
Mar	2.89	8,158	69	34,474	346	---	---	---	---	---	---	S17081
Apr	2.95	10,665	141	44,327	533	---	---	---	---	---	---	S17086
May	2.81	8,662	47	41,135	340	---	---	---	---	---	---	S17091
Jun	2.87	8,752	73	35,165	377	---	---	---	---	---	---	S17096
Jul	2.93	8,791	102	40,208	418	---	---	---	---	---	---	S17100
Aug	2.79	9,476	138	44,096	552	---	---	---	---	---	---	S17105
Sep	2.84	8,537	125	38,370	503	---	---	---	---	---	---	S17111
Oct	3.03	7,820	113	33,116	370	---	---	---	---	---	---	S17116
Nov	3.02	9,183	173	34,470	457	---	---	---	---	---	---	S17120
Dec	2.96	8,712	126	37,934	313	---	---	---	---	---	---	S17124
1996												
Jan	2.27	---	107	---	515	---	---	---	---	---	---	063431
Feb	2.36	---	95	---	826	---	---	---	---	---	---	063434
Mar	2.25	---	92	---	438	---	---	---	---	---	---	063439
Apr	2.42	---	61	---	415	---	---	---	---	---	---	063444
May	2.66	---	101	---	444	---	---	---	---	---	---	063447
Jun	2.55	---	103	---	561	---	---	---	---	---	---	063450
Jul	2.38	---	74	---	431	---	---	---	---	---	---	063455
Aug	2.48	---	90	---	555	---	---	---	---	---	---	063462
Sep	2.40	---	100	---	624	---	---	---	---	---	---	063465
Oct	2.42	---	76	---	355	---	---	---	---	---	---	063470
Nov	2.40	---	158	---	339	---	---	---	---	---	---	063475
Dec	2.51	---	124	---	475	---	---	---	---	---	---	063480
1998												
Jan	2.82	---	214	---	510	---	---	---	---	---	---	063486
Feb	2.84	---	163	---	386	---	---	---	---	---	---	063491
Mar	2.52	---	124	---	403	---	---	---	---	---	---	063497
Apr	2.38	---	185	---	379	---	---	---	---	---	---	063505
May	2.54	---	211	---	395	---	---	---	---	---	---	063513
Jun	2.73	---	271	---	505	---	---	---	---	---	---	063525
Jul	2.78	---	285	---	368	---	---	---	---	---	---	063520
Aug	2.61	---	220	---	400	---	---	---	---	---	---	063532
Sep	2.60	---	231	---	360	---	---	---	---	---	---	063539
Oct	2.53	---	292	---	379	---	---	---	---	---	---	063546
Nov	2.71	---	224	---	301	---	---	---	---	---	---	063553
Dec	2.69	---	180	---	243	---	---	---	---	---	---	063560
1999												
Jan	2.72	---	271	---	394	---	---	---	---	---	---	063248
Feb	2.72	---	290	---	396	---	---	---	---	---	---	063255
Mar	2.73	---	272	---	375	---	---	---	---	---	---	063262

Table 1. Historical Wastewater Data Summary for Outfall 005.

Year/Month	Discharge (mgd)	Influent BOD (lbs/day)	Effluent BOD (lbs/day)	Influent TSS (lbs/day)	Effluent TSS (lbs/day)	Influent TDS (lbs/day)	Effluent TDS (lbs/day)	Influent TVS (lbs/day)	Effluent TVS (lbs/day)	Influent PCB (ug/l)	Effluent PCB (ug/l)	Source
(1999) Apr	2.82	---	245	---	315	---	---	---	---	---	---	063270
May	2.83	---	292	---	333	---	---	---	---	---	---	063277
Jun	2.86	---	343	---	257	---	---	---	---	---	---	063284
Jul	2.87	---	253	---	302	---	---	---	---	---	---	063291
Aug	2.66	---	348	---	293	---	---	---	---	---	---	063297
Sep	2.51	---	367	---	192	---	---	---	---	---	---	063304
Oct	2.63	---	374	---	373	---	---	---	---	---	---	063311
Nov	2.55	---	237	---	285	---	---	---	---	---	---	063319
Dec	2.59	---	187	---	289	---	---	---	---	---	---	063327
2000												
Jan	2.38	---	174	---	300	---	---	---	---	---	---	063336
Feb	2.40	---	173	---	183	---	---	---	---	---	---	063343
Mar	2.46	---	221	---	181	---	---	---	---	---	---	063354
Apr	2.60	---	230	---	184	---	---	---	---	---	---	063361
Jun	2.45	---	240	---	188	---	---	---	---	---	---	063369
Jul	2.30	---	191	---	205	---	---	---	---	---	---	063377
Aug	2.60	---	186	---	214	---	---	---	---	---	---	063383
Sep	2.26	---	192	---	277	---	---	---	---	---	---	063392
Oct	2.22	---	217	---	273	---	---	---	---	---	---	063400

Notes:

Data represents monthly averages, unless otherwise indicated; data for some months is calculated from daily values.

1 MDNR/WRC Survey data. Calculated average value from daily (24 hour composite sample) values.
2 MDNR/WRC Survey data. Represents single day of monitoring (24 hour composite sample).
3 Mass discharge estimates calculated based upon available analytical concentration and flow rate data.
4 Average values based on 56 samples collected from June 28, 1960 through September 23, 1960 (S24503).
5 Represents a single day of monitoring.
6 MDNR/WRC Survey data. Represents a single, grab sample.
7 MDNR/WRC Survey data. Represents a single, grab sample. Discharge value is that of the corresponding 24 hour composite sample, not the grab sample.
8 Using the flow value, lbs/day was derived from a ppm value.
9 Average values based on 7 samples collected from February 5, 1968 through February 11, 1968 (S20136).
10 Average values based on 7 samples collected from March 27, 1972 through April 2, 1972 (S18932).
11 Average values based on 21 samples collected from October 1, 1973 through October 21, 1973 (S20502-S20504).
12 Average values based on 18 samples collected from October 1, 1973 through October 21, 1973 (S20502-S20504).
13 Yearly value based on 233 days.
14 Average values based on samples collected between October 6, 1960 and October 20, 1960.

lbs/day pounds per day
mgd million gallons per day
ppb parts per billion
ppm parts per million
ppt parts per trillion
ug/l micrograms per liter
BOD Biochemical Oxygen Demand
PCB Polychlorinated Biphenyl

Table 1. Historical Wastewater Data Summary for Outfall 005.

Year/Month	Discharge (mgd)	Influent BOD (lbs/day)	Effluent BOD (lbs/day)	Influent TSS (lbs/day)	Effluent TSS (lbs/day)	Influent TDS (lbs/day)	Effluent TDS (lbs/day)	Influent TVS (lbs/day)	Effluent TVS (lbs/day)	Influent PCB (ug/l)	Effluent PCB (ug/l)	Source

TDS Total Dissolved Solids
TSS Total Suspended Solids
TVS Total Volatile Solids
bold This indicates values/text that were not present in the 06/29/01 Response to the Mediation Questionnaire.
Highlighting indicates areas where changes were made from the previous 06/29/01Response to the Mediation Questionnaire.

Table 2. Historical Wastewater Data Summary for Outfalls 002, 003, and 004.

Outfall	Year/Month	Discharge (mgd)	Effluent BOD (lbs/day)	Effluent BOD (ppm)	Effluent TSS (lbs/day)	Effluent TSS (ppm)	Effluent TDS (lbs/day)	Effluent TDS (ppm)	Effluent TVS (lbs/day)	Effluent TVS (ppm)	Influent PCB (ug/L)	Effluent PCB (ug/L)	Source
OUTFALL 002 (Assumed to be Sewer No. 2)													
002	1957												
	Dec [1]	0.3	100	---	1,001	---	---	---	313	---	---	---	S22497
	Dec [1]	0.313	117	---	1,373	---	---	---	345	---	---	---	S22497
002	1959												
	Aug	1.018	340	---	1,138	---	---	---	458	---	---	---	S24496; 064048-064049
	Aug	1.032	361	---	1,136	---	---	---	534	---	---	---	S24496; 064048-064049
002	1961												
	Jun	0.7	876 [2]	---	1,810 [2]	---	---	---	1,133 [2]	---	---	---	KJ00800078
002	1965												
	---	1.09 - 1.36 [3]	---	---	3,886 - 12,987 [3]	---	---	---	1,390 - 4,375 [3]	---	---	---	S22082
	---	1.12 [7]	2,300 [7]	---	8,436 [7]	---	---	---	---	---	---	---	S19776
002	1971												
	Jul	---	---	0-2 [8]	---	15 [8]	---	407 [8]	---	66 [8]	---	---	S16118
002	1973												
	Apr	0.096 [4]	4.8 [4]	---	13.6 [4]	---	291 [4]	---	---	---	---	---	KS01400005
	Apr	0.096 [4]	<4.0 [4]	---	12.8 [4]	---	194 [4]	---	---	---	---	---	KS01400005
	Dec	0.25	45	---	111	---	---	---	68	---	---	---	051655; 051707-051708
002	1974			---				---		---			
	Jan	0.24	7	---	13	---	---	---	8	---	---	---	051656-051660; 051709-051712
	Feb	0.21	5	---	10	---	---	---	3	---	---	---	051661-051664; 051713-051715
	Mar	0.23	224	---	213	---	---	---	120	---	---	---	051665-051668; 051716-051719
	Apr	0.21	63	---	298	---	---	---	124	---	---	---	051669-051672; 051720-051723
	May	0.21	2	---	---	---	---	---	---	---	---	---	051673-051677; 051724-051726
	Jun	0.08	2	---	7	---	---	---	2	---	---	---	051678-051680; 051727-051729
	Jul	0.16	6	---	44	---	---	---	9	---	---	---	051681-051684; 051730-051733
	Aug	0.22	9	---	9	---	---	---	9	---	---	---	051685-051689; 051734-051738
	Sep	0.13	6	---	39	---	---	---	2	---	---	---	051690-051693; 051739-051742
	Oct	0.14	10	---	2	---	---	---	2	---	---	---	051694-051697; 051743-051746
	Nov	0.18	8	---	0	---	---	---	0	---	---	---	051698-051702; 051747-051751
	Dec	0.13	10	---	22	---	---	---	---	---	---	---	051703-051706; 051752-051755
002	1975												
	Jan	0.03 [8]	1 [8]	---	3 [8]	---	---	---	3 [8]	---	---	---	050487, 050537
	Feb	0.03 [8]	2 [8]	---	3 [8]	---	---	---	1 [8]	---	---	---	050482, 050532
	Mar	0.03 [8]	1 [8]	---	2 [8]	---	---	---	2 [8]	---	---	---	050478, 050528
	Apr	0.03 [8]	1 [8]	---	5 [8]	---	---	---	5 [8]	---	---	---	050474, 050524
	May	0.033 [4]	<5 mg/l [4]	---	26 [4]	---	136 [4]	---	52 [4]	---	---	---	S21004
		---	<5 mg/l [5]	---	---	---	---	---	---	---	---	---	S21004
		---	<5 mg/l [5]	---	---	---	---	---	---	---	---	---	S21004

Table 2. Historical Wastewater Data Summary for Outfalls 002, 003, and 004.

Outfall	Year/Month	Discharge (mgd)	Effluent BOD (lbs/day)	Effluent BOD (ppm)	Effluent TSS (lbs/day)	Effluent TSS (ppm)	Effluent TDS (lbs/day)	Effluent TDS (ppm)	Effluent TVS (lbs/day)	Effluent TVS (ppm)	Influent PCB (ug/L)	Effluent PCB (ug/L)	Source
(002)	(1975) Jun	0.03[8]	1[8]	---	4[8]	---	---	---	3[8]	---	---	---	050465, 050515
	Jul	0.027[9]	4[9]	---	1.9[13]	8.2[8]	---	---	---	---	---	---	054460, 050511
	Aug	0.027[8]	0.5[8]	---	---	---	---	---	---	---	---	---	050455
	Sep	0.027[8]	1[8]	---	12[13]	52[8]	---	---	12[13]	52[8]	---	---	050453, 050503
	Oct	---	---	---	1[8]	---	---	---	---	429[8]	---	---	050497
	Nov	0.029[8]	0[9]	---	39[13]	159[8]	---	---	11[13]	47[8]	---	---	050442, 050495
	Dec	---	---	---	---	15[8]	---	---	---	1[8]	---	---	050491
002	1976												
	Jan	0.03	3	---	11[13]	45[8]	---	---	4.5[13]	18[8]	---	---	S15573, **060200**
	Feb	0.03	2	---	2.5[13]	10[8]	---	---	1.8[13]	7[8]	---	---	S15507, **060197**
	Mar	0.03	2	---	1[8]	---	---	---	1[8]	---	---	---	S15509, **060192**
	Apr	0.03[8]	1[8]	---	---	---	---	---	---	---	---	---	060143
	May	0.03	7	---	5.4[13]	21.5[8]	---	---	0.50[13]	2[8]	---	---	S15559, **060182**
	Jun	0.03	2	---	---	---	---	---	---	---	---	---	S15557
	Jul	0.03[8]	0.6[8]	---	5.2[8]	---	---	---	3.8[8]	---	---	---	060131, 060173
	Aug	0.07[4]	<5 mg/l[4]	---	11[4]	---	250[4]	---	---	---	---	<0.1[4]	S21043
		0.058[5]	<5 mg/l[5]	---	13[5]	---	---	---	---	---	---	---	S21044
		0.058[5]	<5 mg/l[5]	---	10[5]	---	---	---	---	---	---	---	S21044
	Sep	0.03	---	---	---	---	---	---	---	---	---	---	S15517
OUTFALL 003													
003	1965												
	---	0.223 -0.439	---	---	948 - 3,476[3]	---	---	---	366 - 1,072[3]	---	---	---	S22082
	---	0.525[7]	440[7]	---	2,873[7]	---	---	---	---	---	---	---	S19776
003	1971												
	Jul	---	---	0-2[8]	---	2[8]	---	370[8]	---	64[8]	---	---	S16118
003	1973												
	Apr	0.404[4]	16.8[4]	---	10.1[4]	---	1,260[4]	---	---	---	---	---	KS01400006
	Apr	0.331[4]	13.8[4]	---	16.6[4]	---	899[4]	---	---	---	---	---	KS01400006
	Dec	0.3	5	---	5	---	---	---	5	---	---	---	051655; 051707-051708
003	1974												
	Jan	0.35	12	---	29	---	---	---	18	---	---	---	051656-051660; 051709-051712
	Feb	0.33	8	---	40	---	---	---	7	---	---	---	051661-051664; 051713-051715
	Mar	0.44	26	---	50	---	---	---	43	---	---	---	051665-051668; 051716-051719
	Apr	0.37	8	---	19	---	---	---	14	---	---	---	051669-051672; 051720-051723
	May	0.29	2	---	3	---	---	---	3	---	---	---	051673-051677; 051724-051726
	Jun	0.31	6	---	10	---	---	---	4	---	---	---	051678-051680; 051727-051729

Table 2. Historical Wastewater Data Summary for Outfalls 002, 003, and 004.

Outfall	Year/Month	Discharge (mgd)	Effluent BOD (lbs/day)	Effluent BOD (ppm)	Effluent TSS (lbs/day)	Effluent TSS (ppm)	Effluent TDS (lbs/day)	Effluent TDS (ppm)	Effluent TVS (lbs/day)	Effluent TVS (ppm)	Influent PCB (ug/L)	Effluent PCB (ug/L)	Source
(003)	(1974) Jul	0.36	64	---	152	---	---	---	30	---	---	---	051681-051684; 051730-051733
	Aug	0.19	4	---	6	---	---	---	6	---	---	---	051685-051689; 051734-051738
	Sep	0.22	2	---	7	---	---	---	7	---	---	---	051690-051693; 051739-051742
	Oct	0.29	29	---	19	---	---	---	12	---	---	---	051694-051697; 051743-051746
	Nov	0.06	0	---	2	---	---	---	2	---	---	---	051698-051702; 051747-051751
	Dec	0.21	16	---	19	---	---	---	---	---	---	---	051703-051706; 051752-051755
003	1975												
	Jan	0.08 [8]	4 [8]	---	3 [8]	---	---	---	3 [8]	---	---	---	050487, 050537
	Feb	0.14 [8]	13 [8]	---	4 [8]	---	---	---	1 [8]	---	---	---	050482, 050532
	Mar	0.2 [8]	21 [8]	---	8 [8]	---	---	---	8 [8]	---	---	---	050478, 050528
	Apr	0.18 [8]	2 [8]	---	14 [8]	---	---	---	14 [8]	---	---	---	050474, 050524
	May	0.244 [4]	<5 mg/l [4]	---	8 [4]	---	813 [4]	---	236 [4]	---	---	---	S21004
		---	<5 mg/l [5]	---	---	---	---	---	---	---	---	---	S21004
		---	<5 mg/l [5]	---	---	---	---	---	---	---	---	---	S21004
	Jun	0.21 [8]	4 [8]	---	15 [8]	---	---	---	15 [8]	---	---	---	050465, 050515
	Jul	0.15 [9]	4 [9]	---	8.3 [13]	6.6 [8]	---	---	---	---	---	---	050459-050460, 050511
	Aug	0.17 [8]	9 [8]	---	---	---	---	---	---	---	---	---	050455
	Sep	0.20 [8]	8 [8]	---	0 [13]	0 [8]	---	---	0 [13]	0 [8]	---	---	050453, 050503
	Oct	---	---	11 [8]	61 [8]	---	---	---	---	32 [8]	---	---	050447, 050496
	Nov	0.17 [8]	3.5 [9]	---	28 [13]	20 [8]	---	---	16 [13]	11 [8]	---	---	050442-050445, 050495
	Dec	---	---	---	---	1 [8]	---	---	---	1 [8]	---	---	050491
003	1976												
	Jan	0.18	---	---	36 [13]	24 [8]	---	---	11 [13]	7 [8]	---	---	S15503, 060200
	Feb	0.14	---	---	1.2 [13]	1 [8]	---	---	1.2 [13]	1 [8]	---	---	S15511, 060197
	Mar	0.17	---	---	18 [8]	---	---	---	11 [8]	---	---	---	S15513, 060192
	Apr	0.18	---	---	---	---	---	---	---	---	---	---	S15519
	May	0.18 [8]	8 [8]	---	2.3 [13]	1.5 [8]	---	---	2.3 [13]	1.5 [8]	---	---	060139, 060182
	Jun	0.14	---	---	---	---	---	---	---	---	---	---	S15505
	Jul	0.14 [8]	1.56 [8]	---	14 [8]	---	---	---	4.6 [8]	---	---	---	060131, 060173
	Aug	0.24 [4]	<5 mg/l [4]	---	12 [4]	---	770 [4]	---	---	---	---	<0.1 [4]	S21043
		0.24 [5]	<5 mg/l [5]	---	12 [5]	---	---	---	---	---	---	---	S21044
		0.24 [5]	<5 mg/l [5]	---	10 [5]	---	---	---	---	---	---	---	S21044
	Sep	0.11	---	---	---	---	---	---	---	---	---	---	S15515
OUTFALL 004													
004	1971												
	Jul	---	---	0-2 [8]	---	2 [8]	---	1,118 [8]	---	256 [8]	---	---	S16118
004	1973												
	Apr	0.16 [4]	103 [4]	---	20 [4]	---	834 [4]	---	---	---	---	---	KS01400007

Table 2. Historical Wastewater Data Summary for Outfalls 002, 003, and 004.

Outfall	Year/Month	Discharge (mgd)	Effluent BOD (lbs/day)	Effluent BOD (ppm)	Effluent TSS (lbs/day)	Effluent TSS (ppm)	Effluent TDS (lbs/day)	Effluent TDS (ppm)	Effluent TVS (lbs/day)	Effluent TVS (ppm)	Influent PCB (ug/L)	Effluent PCB (ug/L)	Source
(004)	(1973) Apr	0.18[4]	96[4]	---	35[4]	---	957[4]	---	---	---	---	---	KS01400007
	Dec	0.23	19	---	10	---	---	---	10	---	---	---	051655; 051707-051708
004	1974												
	Jan	0.21	7	---	41	---	---	---	10	---	---	---	051656-051660; 051709-051712
	Feb	0.28	11	---	43	---	---	---	14	---	---	---	051661-051664; 051713-051715
	Mar	0.25	14	---	31	---	---	---	20	---	---	---	051665-051668; 051716-051719
	Apr	0.14	2	---	18	---	---	---	8	---	---	---	051669-051672; 051720-051723
	May	0.11	12	---	24	---	---	---	28	---	---	---	051673-051677; 051724-051726
	Jun	0.13	16	---	27	---	---	---	3	---	---	---	051678-051680; 051727-051729
	Jul	0.13	9	---	46	---	---	---	5	---	---	---	051681-051684; 051730-051733
	Aug	0.13	5	---	47	---	---	---	14	---	---	---	051685-051689; 051734-051738
	Sep	0.13	5	---	17	---	---	---	10	---	---	---	051690-051693; 051739-051742
	Oct	0.13	31	---	19	---	---	---	18	---	---	---	051694-051697; 051743-051746
	Nov	0.21	10	---	21	---	---	---	15	---	---	---	051698-051702; 051747-051751
	Dec	0.18	10	---	61	---	---	---	9	---	---	---	051703-051706; 051752-051755
004	1975												
	Jan	0.14[11]	15[10]	---	14.6[11]	---	---	---	9.6[11]	---	---	---	050486-050489, 050535-050539
	Feb	0.09[10]	22.75	---	16.75[10]	---	---	---	14.75[10]	---	---	---	050481-050484, 050531-050534
	Mar	0.11[10]	10.25[10]	---	14[10]	---	---	---	9[10]	---	---	---	050477-050480, 050527-050530
	Apr	0.14[10]	23[10]	---	12.5[10]	---	---	---	6.25[10]	---	---	---	050473-050476, 050523-050526
	May	0.11[4]	11[4]	---	27[4]	---	2,050[4]	---	377[4]	---	---	---	S21003
	Jun	0.09[10]	1.5[12]	---	13[12]	---	---	---	8.3[12]	---	---	---	050464-050467, 050515-050517
	Jul	0.06[9]	3[12]	---	10.2[10]	---	---	---	10[10]	---	---	---	050459-050460, 050509-050513
	Aug	0.39[10]	2.23[10]	---	58[10]	---	---	---	8[8]	---	---	---	050455-050458, 050505-050508
	Sep	0.13[10]	9.25[10]	---	1.1[13]	1[10]	---	---	1.1[13]	1[10]	---	---	050451-050454, 050501-050504
	Oct[8]	0.21[11]	0.44[11]	---	4.5[9]	---	---	---	---	---	---	---	050446, 050496-050497
	Nov	0.14[10]	4[10]	---	19.3[10]	---	---	---	14[10]	---	---	---	050442-050445, 050492-050495
	Dec[9]	0.16[9]	4.13[9]	---	5.0[13]	3.75[9]	---	---	5.0[13]	3.75[9]	---	---	050440, 050490-050491
004	1976												
	Jan	0.11	5.25	---	34	---	---	---	---	---	---	---	S15543-S15544
	Feb	0.11	0.5	---	7.5	---	---	---	---	---	---	---	S15545-S15546
	Mar	0.09	1	---	6.3	---	---	---	---	---	---	---	S15547-S15548
	Apr	0.07	5.86	---	2[10]	---	---	---	---	---	---	---	S15550, 060187-060190
	May	0.10[10]	4.75[10]	---	4.25[10]	---	---	---	3.5[10]	---	---	---	060139-060142, 060182-060185
	Jun	0.1	3.25	---	4.3[10]	---	---	---	---	---	---	---	S15562, 060178-060181
	Jul	0.1	2.13	---	7.62[10]	---	---	---	4.70[10]	---	---	---	S15556, 060173-060176
	Aug	0.08[4]	<5 mg/l[4]	---	4[4]	---	1,000[4]	---	---	---	---	<0.1[4]	S21044
		0.086[5]	4[5]	---	6[5]	---	---	---	---	---	---	---	S21044
		0.077[5]	4[5]	---	5[5]	---	---	---	---	---	---	---	S21044
	Sep	0.061[10]	2.2	---	7.25[10]	---	---	---	6.4[10]	---	---	---	060123-060126, 060165-060168
	Oct	0.12	3.5	---	6.8[11]	---	---	---	6.4[11]	---	---	---	S15564, 060160-060164

Table 2. Historical Wastewater Data Summary for Outfalls 002, 003, and 004.

Outfall	Year/Month	Discharge (mgd)	Effluent BOD (lbs/day)	Effluent BOD (ppm)	Effluent TSS (lbs/day)	Effluent TSS (ppm)	Effluent TDS (lbs/day)	Effluent TDS (ppm)	Effluent TVS (lbs/day)	Effluent TVS (ppm)	Influent PCB (ug/L)	Effluent PCB (ug/L)	Source
(004)	(1976) Dec	0.13	3	---	4	---	---	---	---	---	---	---	S15565-S15566
004	1977												
	Jan	0.1	2.0	---	4.0	---	---	---	---	---	---	---	S15637
	Feb	0.08	1.0	---	3.0	---	---	---	---	---	---	---	S15640
	Mar	0.07	1.0	---	3.0	---	---	---	---	---	---	---	S15642
	Apr	0.07	1.0	---	1.0	---	---	---	---	---	---	---	S15643
	May	0.05	1.0	---	2.5	---	---	---	---	---	---	---	S15646
	Jun	0.07	<1.0	---	2.0	---	---	---	---	---	---		S15648
	Aug	0.07	1.0	---	2.0	---	---	---	---	---	---	---	S15652
	Sep	0.04	1.0	---	1.0	---	---	---	---	---	---	---	S15654
	Oct	0.04	1.8	---	<1.0	---	---	---	---	---	---	---	S15657
	Nov	0.05	1.0	---	1.0	---	---	---	---	---	---	---	S15661
	Dec	0.06	1.0	---	1.5	---	---	---	---	---	---	---	S15664
004	1978												
	Jan	0.06	1.0	---	1.0	---	---	---	---	---	---	---	S15749
	Feb	0.04	1.0	---	1.0	---	---	---	---	---	---	---	S15752
	Mar	0.05	1.0	---	1.0	---	---	---	---	---	---	---	S15755
	Apr	0.06	1.0	---	2.4	---	---	---	---	---	---	---	S15757
	May	0.04	1.0	---	1.1	---	---	---	---	---	---	---	S15760
	Jun	0.04	1.0	---	1.0	---	---	---	---	---	---	---	S15763
	Jul	0.02	1.0	---	1.0	---	---	---	---	---	---	---	S15765
		0.073 [4]	1.72 [4]	---	0.7 [4]	---	353 [4]	---	---	---	---	0.1 [4]	S21253
		0.073 [6]	1 [6]	---	2 [6]	---	347 [6]	---	---	---	---	---	S21254
		0.073 [6]	1 [6]	---	<1 mg/l [6]	---	305 [6]	---	---	---	---	---	S21254
	Aug	0.02	<1.0	---	<1.0	---	---	---	---	---	---	0.1	S15768; S18476
	Sep	0.04	1.1	---	1.3	---	---	---	---	---	---	---	S15772
	Oct	0.06	2.0	---	1.0	---	---	---	---	---	---	---	S15774
	Nov	0.05	1.0	---	<1.0	---	---	---	---	---	---	---	S15776
	Dec	0.05	1.2	---	1.0	---	---	---	---	---	---	---	S15779
004	1979												
	Jan	0.07	2.4	---	0.4	---	---	---	---	---	---	---	S15879; S15880
	Feb	0.05	1.5	---	<1.0	---	---	---	---	---	---	---	S15887; S15888
	Mar	0.04	< 1.0	---	1.0	---	---	---	---	---	---	---	S15891; S15892
	Apr	0.04	1.0	---	<1.0	---	---	---	---	---	---	---	
	May	0.07	---	---	---	---	---	---	---	---	---	---	S15893
	Jun	0.07	---	---	---	---	---	---	---	---	---	---	S15897
	Jul	0.07	---	---	---	---	---	---	---	---	---	---	S15907
	Aug	0.06	---	---	---	---	---	---	---	---	---	---	S15918
	Sep	0.05	---	---	---	---	---	---	---	---	---	<0.1	S18471
	Sep	0.22 [4]	6.4 [13]	3.5 [4]	0 [13]	0 [4]	0 [13]	0 [4]	---	---	---	---	S21204
	Oct	0.07	---	---	---	---	---	---	---	---	---	---	S15924

Table 2. Historical Wastewater Data Summary for Outfalls 002, 003, and 004.

Outfall	Year/Month	Discharge (mgd)	Effluent BOD (lbs/day)	Effluent BOD (ppm)	Effluent TSS (lbs/day)	Effluent TSS (ppm)	Effluent TDS (lbs/day)	Effluent TDS (ppm)	Effluent TVS (lbs/day)	Effluent TVS (ppm)	Influent PCB (ug/L)	Effluent PCB (ug/L)	Source
(004)	(1979) Nov	0.06	---	---	---	---	---	---	---	---	---	---	S15932
	Dec	0.06	---	---	---	---	---	---	---	---	---	---	S15936
004	1980												
	Jan	0.04	---	---	---	---	---	---	---	---	---	---	S14584
	Feb	0.03	---	---	---	---	---	---	---	---	---	---	S14582
	Mar	0.03	---	---	---	---	---	---	---	---	---	---	S14580
	Apr	0.03	---	---	---	---	---	---	---	---	---	---	S14578
	Jun	0.03	---	---	---	---	---	---	---	---	---	---	S14574
		0.07[4]	5.9 mg/l[4]	---	4.0 mg/l[4]	---	404[4]	---	---	---	---	---	066696
	Jul	0.05	---	---	---	---	---	---	---	---	---	---	S14569
	Aug	0.05	---	---	---	---	---	---	---	---	---	---	S14567
	Sep	0.04	---	---	---	---	---	---	---	---	---	---	S14564
	Oct	0.05	---	---	---	---	---	---	---	---	---	---	S14563
	Nov	0.03	---	---	---	---	---	---	---	---	---	---	S14561
	Dec	0.05	---	---	---	---	---	---	---	---	---	---	S14559
004	1981												
	Jan	0.08	---	---	---	---	---	---	---	---	---	---	S14549
	Feb	0.09	---	---	---	---	---	---	---	---	---	---	S14546
	Mar	0.10	---	---	---	---	---	---	---	---	---	---	S21628
	Apr	0.12	---	---	---	---	---	---	---	---	---	---	S14542
	May	0.12	---	---	---	---	---	---	---	---	---	---	S14541
	Jun	0.13	---	---	---	---	---	---	---	---	---	---	S14539
	Jul	0.12	---	---	---	---	---	---	---	---	---	---	S14537
	Aug	0.16	---	---	---	---	---	---	---	---	---	---	S14535
	Sep	0.10	---	---	---	---	---	---	---	---	---	---	S21628
	Oct	0.13	---	---	---	---	---	---	---	---	---	---	S14530
004	1982												
	Jan	0.06	---	---	---	---	---	---	---	---	---	---	S14597
	Feb	0.05	---	---	---	---	---	---	---	---	---	---	S14599
	Mar	0.07	---	---	---	---	---	---	---	---	---	---	S14601
	Apr	0.07	---	---	---	---	---	---	---	---	---	---	S14603
	May	0.06	---	---	---	---	---	---	---	---	---	---	S14605
	Jun	0.05	---	---	---	---	---	---	---	---	---	---	S14613
	Jul	0.08	---	---	---	---	---	---	---	---	---	---	S14606
	Aug	0.09	---	---	---	---	---	---	---	---	---	---	S14609
	Sep	0.13	---	---	---	---	---	---	---	---	---	---	S14611
	Oct	0.12	---	---	---	---	---	---	---	---	---	---	S14592
		0.2[4]	---	---	<4 mg/l[4]	---	635[4]	---	---	---	---	---	S21555
	Nov	0.12	---	---	---	---	---	---	---	---	---	---	S14594
	Dec	0.09	---	---	---	---	---	---	---	---	---	---	S14596

Table 2. Historical Wastewater Data Summary for Outfalls 002, 003, and 004.

Outfall	Year/Month	Discharge (mgd)	Effluent BOD (lbs/day)	Effluent BOD (ppm)	Effluent TSS (lbs/day)	Effluent TSS (ppm)	Effluent TDS (lbs/day)	Effluent TDS (ppm)	Effluent TVS (lbs/day)	Effluent TVS (ppm)	Influent PCB (ug/L)	Effluent PCB (ug/L)	Source
004	1983												
	Jan	0.09	---	---	---	---	---	---	---	---	---	---	S21588
	Feb	0.07	---	---	---	---	---	---	---	---	---	---	S14626
	Mar	0.07	---	---	---	---	---	---	---	---	---	---	S14628
	Apr	0.07	---	---	---	---	---	---	---	---	---	---	S14630
	May	0.05	---	---	---	---	---	---	---	---	---	---	S14632
	Jun	0.09	---	---	---	---	---	---	---	---	---	---	S14634
	Jul	0.11	---	---	---	---	---	---	---	---	---	---	S21588
	Aug	0.11	---	---	---	---	---	---	---	---	---	---	S14649
	Sep	0.12	---	---	---	---	---	---	---	---	---	---	S21588
	Oct	0.11	---	---	---	---	---	---	---	---	---	---	S14636
	Nov	0.12	---	---	---	---	---	---	---	---	---	---	S14638
	Dec	0.13	---	---	---	---	---	---	---	---	---	---	S14640
004	1984												
	Jan	0.16	---	---	---	---	---	---	---	---	---	---	S13596
	Feb	0.12	---	---	---	---	---	---	---	---	---	---	S13590
	Mar	0.17	---	---	---	---	---	---	---	---	---	---	S13600
	Apr	0.18	---	---	---	---	---	---	---	---	---	---	S13621
	May	0.13	---	---	---	---	---	---	---	---	---	---	S13640
	Aug	0.09	---	---	---	---	---	---	---	---	---	---	S13610
	Sep	0.14	---	---	---	---	---	---	---	---	---	---	S13602
	Nov	0.13	---	---	---	---	---	---	---	---	---	---	S13629
	Dec	0.14	---	---	---	---	---	---	---	---	---	---	S13638
004	1985												
	Jan	0.13 [4]	<3 mg/l [4]	---	4.41 [4]		353 [4]	---	---	---	---	---	S21551
	Mar	0.18	---	---	---	---	---	---	---	---	---	---	S13570
	Apr	0.14	---	---	---	---	---	---	---	---	---	---	S13564
	May	0.12	---	---	---	---	---	---	---	---	---	---	S13627
	Jun	0.12	---	---	---	---	---	---	---	---	---	---	S13548
	Jul	0.11	---	---	---	---	---	---	---	---	---	---	S13558
	Aug	0.09	---	---	---	---	---	---	---	---	---	---	S13524
	Sep	0.07	---	---	---	---	---	---	---	---	---	---	S13488
	Oct	0	---	---	---	---	---	---	---	---	---	---	S13542
	Dec	0	---	---	---	---	---	---	---	---	---	---	S13536
004	1986												
	Jan	0	---	---	---	---	---	---	---	---	---	---	S13574
	Feb	0	---	---	---	---	---	---	---	---	---	---	S13650
	Mar	0	---	---	---	---	---	---	---	---	---	---	S13512
	Apr	0	---	---	---	---	---	---	---	---	---	---	S13502
	May	0	---	---	---	---	---	---	---	---	---	---	S13500

Table 2. Historical Wastewater Data Summary for Outfalls 002, 003, and 004.

Outfall	Year/Month	Discharge (mgd)	Effluent BOD (lbs/day)	Effluent BOD (ppm)	Effluent TSS (lbs/day)	Effluent TSS (ppm)	Effluent TDS (lbs/day)	Effluent TDS (ppm)	Effluent TVS (lbs/day)	Effluent TVS (ppm)	Influent PCB (ug/L)	Effluent PCB (ug/L)	Source
(004)	(1986) Jun	0	---	---	---	---	---	---	---	---	---	---	S13518
	Jul	0	---	---	---	---	---	---	---	---	---	---	S13494
	Aug	0	---	---	---	---	---	---	---	---	---	---	S13648
	Sep	0	---	---	---	---	---	---	---	---	---	---	S13476
	Oct	0	---	---	---	---	---	---	---	---	---	---	S13431
	Nov	0	---	---	---	---	---	---	---	---	---	---	S13482
004	1987												
	Jan	0	---	---	---	---	---	---	---	---	---	---	S18047
	Feb	0	---	---	---	---	---	---	---	---	---	---	S13460
	Mar	0	---	---	---	---	---	---	---	---	---	---	S13435
	Apr	0	---	---	---	---	---	---	---	---	---	---	S18050
	May	0	---	---	---	---	---	---	---	---	---	---	S13441
	Jun	0	---	---	---	---	---	---	---	---	---	---	S13452
	Jul	0	---	---	---	---	---	---	---	---	---	---	S13377
	Aug	0	---	---	---	---	---	---	---	---	---	---	S13371
	Sep	0	---	---	---	---	---	---	---	---	---	---	S13376
	Oct	0	---	---	---	---	---	---	---	---	---	---	S13364
	Nov	0	---	---	---	---	---	---	---	---	---	---	S13359
	Dec	0	---	---	---	---	---	---	---	---	---	---	S13350
004	1988												
	Jan	0	---	---	---	---	---	---	---	---	---	---	063403
	Feb	0	---	---	---	---	---	---	---	---	---	---	063405
	Mar	0	---	---	---	---	---	---	---	---	---	---	063407
	Apr	0	---	---	---	---	---	---	---	---	---	---	063409
	May	0	---	---	---	---	---	---	---	---	---	---	063412
	Jun	0	---	---	---	---	---	---	---	---	---	---	063414
	Jul	0	---	---	---	---	---	---	---	---	---	---	063416
	Aug	0	---	---	---	---	---	---	---	---	---	---	063418
	Sep	0	---	---	---	---	---	---	---	---	---	---	063420
	Oct	0	---	---	---	---	---	---	---	---	---	---	063422
	Nov	0	---	---	---	---	---	---	---	---	---	---	063424
	Dec	0	---	---	---	---	---	---	---	---	---	---	063426
004	1989												
	Jan	0	---	---	---	---	---	---	---	---	---	---	S18073
	Feb	0	---	---	---	---	---	---	---	---	---	---	S18070-S18071
	Mar	0	---	---	---	---	---	---	---	---	---	---	S18069
	Apr	0	---	---	---	---	---	---	---	---	---	---	S18065
	May	0	---	---	---	---	---	---	---	---	---	---	S18064
	Jun	0	---	---	---	---	---	---	---	---	---	---	S18063
	Jul	0	---	---	---	---	---	---	---	---	---	---	S18088
	Aug	0	---	---	---	---	---	---	---	---	---	---	S18092
	Sep	0	---	---	---	---	---	---	---	---	---	---	S14496
	Nov	0	---	---	---	---	---	---	---	---	---	---	S18067

Table 2. Historical Wastewater Data Summary for Outfalls 002, 003, and 004.

Outfall	Year/Month	Discharge (mgd)	Effluent BOD (lbs/day)	**Effluent BOD (ppm)**	Effluent TSS (lbs/day)	**Effluent TSS (ppm)**	Effluent TDS (lbs/day)	**Effluent TDS (ppm)**	Effluent TVS (lbs/day)	**Effluent TVS (ppm)**	Influent PCB (ug/L)	Effluent PCB (ug/L)	Source

Notes:

Monthly averages for all data from 1973 through 1975 is based upon a maximum of five daily values for that month.

1 Data based upon two samples taken by the MDNR/WRC in December of 1957.
2 Values calculated based on available data.
3 Data range is based upon daily sampling over a two week period. High BOD and TSS values were attributed to white water overflows. Note that this occurred after the cessation of de-inking in January of 1963.
4 MDNR/WRC Survey data. Represents single day of monitoring (24 hour composite sample).
5 MDNR/WRC Survey data. Represents a single, grab sample.
6 MDNR/WRC Survey data. Represents a single, grab sample. Discharge value is that of the corresponding 24 hour composite sample, not the grab sample.
7 Values are an average of one week of data collected sometime between July 7, 1965, and September 15, 1965. The exact time period associated with the data is unknown (S19775-S19776).
8 Represents a single grab sample.
9 Value is an average of data collected on two days during the month.
10 Value is an average of data collected on four days during the month.
11 Value is an average of data collected on five days during the month.
12 Value is an average of data collected on three days during the month.
13 Using the flow value, lbs/day was derived from a ppm value. Time period for ppm data and flow data are not the same.

lbs/day pounds per day
mgd million gallons per day
mg/l milligrams per liter
ug/l micrograms per liter
BOD Biochemical Oxygen Demand
PCB Polychlorinated Biphenyl
TDS Total Dissolved Solids
TSS Total Suspended Solids
TVS Total Volatile Solids
bold This indicates values/text that were not present in the 06/29/01 Response to the Mediation Questionnaire.
Highlighting indicates areas where changes were made from the previous 06/29/01Response to the Mediation Questionnaire.

Table 10. Known or Documented Bypasses or Spills into the Kalamazoo River.

Date	Materials	Length of Release	Description	Source
8/4/1959	ink wash sump water	Aug 4 - 5	Overflow of water from the ink wash sump discharged into the river; load to the ink wash sump reduced by putting non-contact sealing water from No. 4 vacuum pumps into the river.	S24492
5/20/1968	raw primary waste	May 20 - 22	Leakage due to improperly fitting gate on No. 4 (emergency overflow) sewer resulted in discharge to river.	S24586
5/20/1968	cloudy water	May 20 - 26	Sewer No. 3 was the clear water sewer from the boiler house. A sewer (the document is not specific) containing cloudy water which passed through sewer No. 3 had developed a leak. Thus, sewer No. 3 had a turbid, cloudy appearance.	S24580; S24586
5/11/1969	**wastewater**	**May 11-14**	**Bypass to the river occurred due to sludge pump failure; temporary line was established to redirect waste flow to secondary treatment unit.**	**065383**
5/27/1969	wastewater	May 27 - June 4	Mechanical breakdown in secondary clarifier resulted in bypass to river.	MDNR000230
7/11/1969	**boiler flyash**	**---**	**Report of boiler flyash discharged to the river.**	**065382**
8/18/1969	large foam slug	---	Bypass from the boiler room caused large detergent foam slug from annual cleanup to flow directly to river.	MDNR000232
9/12/1969	wastewater	20 hours	Break in the line between mill sump pit and the primary clarifier resulted in direct discharge to river; caulking joining steel mill pipeline and city transit storm sewer had deteriorated.	MDNR000233
6/23/1970	oil	several occasions	Source document states that several inspections by WRC in the past year revealed "varying amounts of oil" lost to the Kalamazoo River. The automatic oiling system for calendar stacks was the major contributor. Interim measures taken by the Mill as of 6/17/70 had not fully corrected the problem.	MDNR000234
5/4/1972	**waste from sludge pits**	**---**	**Source document states that part of sludge pits are 50 feet from the river bank and therefore "some of this waste must seep to the Kalamazoo River".**	**S15159-S15160**
9/1972	**white water**	**---**	**White water spilled into cooling water sewers.**	**S16880**
4/1973	**oil, boilout, and whitewater**	**---**	**Spilled into cooling water.**	**S16911**
5/30/1974	**sludge**	**---**	**Report of some sludge running into river from marsh adjacent to river.**	**Gren Exhibit #832**

Table 10. Known or Documented Bypasses or Spills into the Kalamazoo River.

Date	Materials	Length of Release	Description	Source
11/17/1975	**oil**	**---**	**Some oil had reached the river as a result of an oil spill. It is unlikely that this oil contained PCBs, because empirical data indicate that oils used in the papermaking process did not contain PCBs (S23067-S23072; S23087).**	**S23461**
8/16/1976	**wastewater**	**August 16-20**	**Secondary clarifier was bypassed during wastewater treatment system changes; changes made to insure compliance with NPDES permit limitations.**	**S21039**
10/1/1976	wastewater	Most of the month of October	Secondary clarifier was bypassed during wastewater treatment system upgrades.	MDNR000241
7/10/1978	water, possibly wastewater	July 10 - 11	MDNR observed an unrecorded flow leaking from outfall 004 around the company weir. MDNR suggested that this made the survey flow larger than the flow reported by the company. The Mill disputed the magnitude of the leak and the resulting exceedances reported by MDNR.	MDNR000250; MDNR000255
2/15/1979	wastewater	February 15	Bypass of the primary clarifier due to a broken gear; no exceedances.	MDNR000257
8/10/1979	wastewater	Aug 10 - 11	"Leakage at 004 (backup generator)."	MDNR000257
9/25/1979	styrene	---	Detected in discharge to river.	MDNR000257
5/18/1982	wastewater	---	Leakage due to improperly fitting gate on No. 4 (emergency overflow) sewer resulted in discharge to river. Weir has been observed leaking during past surveys.	MDNR000336
5/18/1982	wastewater	---	Outfall had a milky appearance and changed colors several times during the survey.	MDNR000336
7/22/1982	white suspended material, apparently paperfiber	July 22	Observed in the southwest third of the Kalamazoo River, just upstream of US 131, the material coated substrates in the slow current regions on the southwest side of the river. On this date, the Plainwell WWTP was clear, therefore, MDNR concluded the source was the Mill discharge.	MDNR000362
8/10/1982	white suspended material, apparently paperfiber	August 10	Material coated a fyke net (a type of net used in fish sampling) placed on the southwest third of the river for about 2 hours. Fyke nets in the center and northeast parts of the river were not affected. On this date, the Plainwell WWTP was clear, therefore, MDNR concluded the source was the Mill discharge.	MDNR000362

Table 10. Known or Documented Bypasses or Spills into the Kalamazoo River.

Date	Materials	Length of Release	Description	Source
12/27/1982	suspended white particulate material	October 10 (document may be referring to observation on August 10)	The white material appeared to be paper fiber and it coated substrates in the slow current areas on the southern side of the river. The source is indicated as a Plainwell discharge. May be referring to observation on August 10.	MDNR000427
5/9/1986	sludge	7:30 am - 8:30 am	Discharge onto ground from old primary clarifier while pumping to sludge holding tank; discharge was several hundred feet from the dewatering facility. Sludge was coming up from under ground and some liquid was running down the bank to the river; flow was not continuous, but sporadic, as an estimated 500 gallons of water from sludge flowed into the river (solid content determined impossible to calculate).	MDNR004120; Responses to 4th Interrogatories; 1997.
6/14/1987	small white flow, consisting of papermaking fibers/fillers	---	Discharge to river from Outfall 003 (roof drainage).	MDNR000981
6/30/1987	raw discharge	June 4 - 5	Break in the raw discharge line to the treatment plant resulted in a cross connection to a stormwater discharge line and "minor unauthorized discharge" to the river.	MDNR000980
8/17/1987	orange water	color present for over 2 hours	Discharge to river from Outfall 004, overflowing from elevated water storage tank; orange color resulted from iron oxide in pipelines or tank sediments.	MDNR000983
1/19/1992	**partially treated wastewater**	**January 19, 1992**	**Minor spill of primary treated wastewater into the river (400-500 gallons). Source of spill was a six inch hole at the upper part of primary effluent flow box.**	**S18608**

Notes:

MDNR Michigan Department of Natural Resources

WRC Water Resources Commission

bold Bold text indicates revisions made from Plainwell's 6/29/01 Response to the Mediation Questionnaire.

Highlighting indicates areas where changes were made from the previous 06/29/01 Response to the Mediation Questionnaire.